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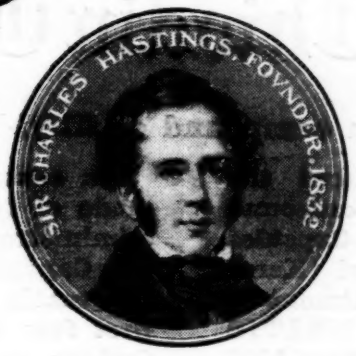

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ON

PSYCHOLOGY AND MEDICINE.

DELIVERED TO THE BROMSGROVE AND DUDLEY DIVISIONS ON NOVEMBER 30TH, 1922,

BY

SIR FREDERICK W. MOTT, K.B.E., F.R.S., M.D., LL.D., F.R.C.P.,

DIRECTOR OF THE PATHOLOGICAL LABORATORY OF THE LONDON COUNTY COUNCIL MENTAL HOSPITALS; CONSULTING PHYSICIAN TO CHARING CROSS HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—Permit me to thank you for the honour you have done me in asking me to address you on the subject of Mental Hygiene. It is especially a pleasant task for me, inasmuch as the City of Birmingham and the University have shown by their recent action how much they are interested in research into the causation, prevention, and remedial treatment of disorders and diseases of the mind. A Research Board will be established, and I have been asked to act as Honorary Director of Research and Lecturer at the University.

BODY AND MIND.

The fundamental basis of mind is begotten with the body. There can be no mind without memory; there can be no memory without body. All psychic processes are subordinate to and dependent upon physiological processes.

No progress was possible in the advancement of our knowledge of mental disease until we had shaken off the spell of metaphysical speculation and the tradition of doctrine of the mind as an invisible intangible spirit with a separate existence in the body. We now generally recognize the brain as the seat of the psyche, but the functions of mind are dependent upon the whole body, and the harmonious interaction of all its parts.

The time-worn dictum, *Mens sana in corpore sano*, implies that if the body is healthy, then the mind is healthy, but there are numbers of people who suffer with bodily disease who nevertheless have a healthy mind; and again, there are numbers of people who have a disordered or diseased mind, but, so far as we can discover, have a healthy body—for example, various types of neuroses and psychoses, and of moral feeble-mindedness. But because we can by our present methods of investigation find no material cause for abnormality, it does not follow that subtile biochemical and biophysical changes, which are dependent upon inborn functional or bodily defects, are not there. Especially do I refer to the latest structures of evolutional development—for example, the cerebral cortex.

Pathological Processes in Relation to Body and Mind.

Pathological processes occurring in the brain may serve as a magnifying glass and help or point the way to the study of mind from a physiological point of view. At present we do not know the complex physiological processes underlying mental processes; but we do know that without oxygen, which is essential for all vital activities of the body, mental processes cease. The biophysical and biochemical processes are fundamentally the same in a simple reflex, the first term of a series, as in volition, which is the last. We now know how important are the internal secretions of the endocrine glands for vital activities of body and mind. Thus the adrenal acts as a reservoir of energenetic substance which in emergency can be called upon automatically to discharge adrenaline into the circulation to excite through the sympathetic nerve the bodily reactions required for fight or flight in response to the emotions of fear and anger. The thyroid secretion, we know, is essential for the development of the organ of mind, for when this gland is absent cretinous idiocy is the result. If the cretin is fed upon thyroid the brain develops and with it the mind. Again, we know that mental energy is dependent upon thyro-iodin, for slowness of thought and action are associated with hypothyroidism and myxœdema. Administration of the gland cures the myxœdema and restores the mental energy.

There is definite clinico-anatomical evidence of the inseparability of body and mind. Thus mental deficiency is associated with, and proportional to, the arrest of development of the supragranular layer of pyramidal cells of the cerebral cortex. In dementia paralytica the dementia is proportional to the extent and degree of destruction of the cortex cerebri which is due to the colonization of the *Spirochaeta pallida* in the brain; therefore, its cause being known, it is a preventable disease, and if preventable why not prevented? Every measure, whether educational, prophylactic, or remedial, which tends to diminish the spread of syphilis will tend to diminish enormously the proportion of cases admitted to asylums, hospitals, institutions for the blind, the deaf, and the dumb, and for mental deficiency due to congenital syphilis.

I do not see anything like the number of cases of congenital syphilis that I formerly did, and this diminution is the general opinion of physicians. If it had not been for the war I have no doubt there would have been a great fall in the incidence of syphilis among the population, but the war, unfortunately, has led to a great recrudescence of infection. Still, education, the Report of the Royal Commission, the change in attitude of the press regarding publicity, the introduction and knowledge of new and more efficient methods of diagnosis and treatment, will certainly diminish the number of infections. Again, the enormous number of men of all ranks in the army who were incapacitated for service at a critical period of the war has aroused public opinion in Britain and the colonies to the necessity of taking effective steps to mitigate this great peril. The campaign of two societies and the public interest aroused in the divergent views regarding the desirability of advocating self-disinfection for the civil population have also done much to awaken the interest of all classes of people. This public interest has stirred the Ministry of Health, and a Commission is at present sitting to investigate the best methods to be adopted for the prevention of the spread of venereal infection. Unfortunately the lowest stratum of society is incapable of appreciating the dangers of communicating infection to others, especially innocent women and children, by neglect of treatment. Yet there can be no doubt the establishment of free treatment centres throughout the country will, together with a wider distribution of knowledge of the causes of the spread of these diseases, and how they may be prevented and cured, lead to an increasing reduction of constitutional syphilis and all the various organic diseases of the nervous system for which it is directly responsible. Statistics indicate that about 10 per cent. of syphilized individuals subsequently die of organic disease of the nervous system, of which about 5 per cent. are general paralytics. A cure has not yet been found for general paralysis, and this makes it all the more imperative to adopt all measures which will lead to the prevention of infection.

THE PSYCHO-NEUROSES, PSYCHOSES, AND MENTAL DEFICIENCIES.

But let us leave these acquired organic brain diseases and turn our attention to those psycho-neuroses, psychoses, and mental defects which we rightly regard as more or less due to inborn dispositions or defects. The last two classes—the insane and mentally deficient—are, owing to their antisocial tendencies or conduct, segregated for economy, with few exceptions, in huge institutions; these so called mental hospitals have as a general rule no separate buildings for acute recoverable and convalescent cases. This mixing of acute, and possibly recoverable, cases with the chronic incurable is now being recognized as a thoroughly bad system, for it leads to a prevailing idea not only of hopelessness in the patients, but of helpless despair, even in those who have the care of them, of employing any medical aid towards assisting them to recover and preventing a relapse.

We may well turn, therefore, to what Francis Bacon said regarding supposed incurable diseases:

"A work therefore is wanting upon the cures of reputed incurable diseases, that physicians of eminence and resolution may be encouraged and excited to pursue this matter, as far as the nature of things will permit, since to pronounce disease incurable is to establish negligence and carelessness as it were, by a law, and screen ignorance from reproach."

Psychology in Relation to the Study of Individual Characters.

Bacon thus advocated a treatise on the mind so that "better knowledge may lead to rules for the treatment of Mind."

"Wherefore out of these materials (which are surely rich and abundant) let a full and careful treatise be constructed. Not, however, that I would have their characters presented in Ethics, as we find them in history, or poetry, or even in common discourse, in the shape of complete individual portraits, but rather the several features and simple lineaments of which they are composed, and the various combinations and arrangements of which all characters whatever are made up, showing how many and of

what nature these are, and how connected and subordinated to one another, so that we may have a scientific and accurate dissection of minds and characters, and the secret dispositions of particular men may be revealed; and that from a knowledge thereof better rules may be framed for the treatment of the mind. And not only should the characters of dispositions which are impressed by nature be received into this treatise, but those also which are imposed upon the mind by sex, by region, by health and sickness, by beauty, deformity, and the like; and again those which are caused by fortune as sovereignty, nobility, magistracy, privateness, prosperity and the like."—*De Augmentis.*

Bacon is here advocating a work upon character founded upon "dispositions impressed by nature" and those which are imposed upon the mind by nurture. Really this is a study of what an individual was born with and what happened after birth.

Psychology in its Application to Medicine.

The late Dr. Mercier, in the preface to his work on insanity, said that he had studied academic psychology as taught in the schools, and it may be remarked there were few who knew it better; yet he states that he found it as useful in practice as the cuneiform language. He asserted that it was disorders of conduct which should be studied.

We can only judge a man's mental state by what he says and what he does, and by the bodily expression of the emotions and passions, which often indicate the thoughts and secret dispositions of men more surely than speech, which, in many instances, is given to man to hide his thoughts.

Dr. Jung, in his remarkable work on analytical psychology, thus expresses his views upon the same subject:

"Modern experimental psychology is very far from being able to afford him any connected insight into the most vital psychic processes—that is not its aim. As far as possible it tries to isolate those simple elementary phenomena which border on the physiological, and then study them in an isolated state. It quite ignores the infinite variation and movement of the mental life of the individual, and, accordingly, its knowledge and its facts are so many isolated details, uninspired by any comprehensive idea capable of bringing them into co-ordination. Hence it comes about that the inquirer after the secrets of the human soul learns rather less than nothing from experimental psychology. He would be better advised to abandon exact science, take off his scholar's gown, say farewell to his study, and then, strong in manly courage, set out to wander through the world; alike through the horrors of prisons, lunatic asylums and hospitals, through dreary outlying taverns, through brothels and gambling hells, into elegant drawing-rooms, the Stock Exchange, socialist meetings, churches, revival gatherings of strange religious sects, experiencing in his own person love and hate and every kind of suffering. He would return laden with richer knowledge than his yard-long textbooks could ever have given him, and thus equipped he can indeed be a physician to his patients, for he understands the soul of man. He may be pardoned if his respect for the 'corner-stones' of experimental psychology is no longer very considerable. There is a great gulf fixed between what science calls 'psychology,' on the one hand, and what the practice of everyday life expects from psychology on the other."

The medical practitioner, much less the student of medicine, is unable to follow Jung's prescription to obtain the knowledge of psychology which will fit him best to understand human nature in all its varied characters and phases. Yet one must admit that this psychology of experience will be of infinitely more use to him than the academic psychology of the schools.

It may be asked, Where can we find the psychology of human character better portrayed than in the dramas of Shakespeare?—for as Schlegel, the great student and translator of Shakespeare into German, in his lectures on the drama says:

"Never perhaps was there so comprehensive a talent for the delineation of character as Shakespeare's. It not only groups the diversities of rank, sex, and age down to the dawnings of infancy; and not only do the king and the beggar, the hero and the pickpocket, the sage and the idiot, speak with equal truth." Then he goes on to say: "If Shakespeare deserves our admiration for his characters, he is equally deserving of it for his exhibition of the passions, taking this word in its widest signification as including every mental condition, every tone from indifference or peculiar mirth to the wildest rage and despair. He gives us the history of minds, he lays open to us in a single word a whole series of preceding conditions. His passions do not at first stand displayed to us in all their height, as in the case of so many tragic poets, who, in the language of Lessing, are thorough masters of the legal style of love. He paints, in a most inimitable manner, the gradual progress from the first origin. 'He gives,' as Lessing says, 'a living picture of all the most minute and secret artifices by which a feeling steals into our souls; of all the imperceptible advantages which it there gains, of all the other stratagems by which every other passion is made subservient to it, till it becomes the sole tyrant of our desires and our aversions.'

"Of all poets, perhaps, he alone has portrayed the mental diseases—melancholy, delirium, lunacy—with such inexpressible, and in every respect definite truth, that the physician may enrich his observations from them in the same manner as from real cases."

In Shakespeare we find the psychology of character revealed in all its aspects, the knowledge of which is so important for the success of a medical man.

Recently a valuable and philosophical work on character, by Mr. Hugh Elliot, has appeared; it is the first attempt which has been made (with the exception of Mr. Shand's *Foundations of Character*) to deal with the subject. He admits that the study of character is not and cannot for a long time be in a state which would justify the introduction of any name ending in "ology." It cannot begin to be a science until we can explain the cause of variations in characters. He remarks that wide knowledge is essential, and yet mere knowledge by itself avails little towards an understanding of character. Some of the most learned men in the world are as children in the comprehension of their fellow men; it is experience, as Jung has said, of the world from many and varied points of view that counts, combined with an intuitive sense.

Intuitive Knowledge of Character.

In all grades of society individuals exist who largely owe their success in life to an intuitive ability to read the motives and secret dispositions of men, and especially is this faculty of importance in the learned professions of Law, Medicine, and the Church. Most intelligent people in all ranks of life are more or less practical psychologists, for they judge of the conduct of their fellow men by analogy of their own thoughts and feelings which would be associated with that conduct; but although they may have practised this intuitive psychology all their life, they would be as surprised as the *bourgeois gentilhomme* in Molière's play was when told he had spoken prose all his life. By study and application this intuitive knowledge can be improved where it is present, and acquired where it is only feebly represented. Our object should be to develop this practical psychology.

THE TEACHING OF PSYCHOLOGY APPLIED TO MEDICINE.

I have been leading up to a thorny question, and that is, whether it is right to introduce any fresh instruction in the medical curriculum; the adage, *Ars longa, vita brevis*, is too true for the medical student to-day. Yet I am constrained, owing to the experience of the war and its aftermath, to support a proposition—namely, that a short course on psychology in its application to medicine should follow a student's teaching in physiology—which I made to the Dean of the Faculty of Medicine of the Victoria University, Manchester, and which has been carried into effect. A letter to me from the Dean of the Medical Faculty states:

"Professor Pear gives four to six lectures in the second or third year as an introduction to psychology, in the course of lectures on the physiology of the nervous system, prior to the Second M.B. In the summer of the third year a short course of six or eight lectures is given on the psychology of human behaviour, and in the Lent Term of the fifth year a similar short course on morbid psychology as an introduction to the lectures on mental diseases, which the students take in the fifth summer."

Sir J. H. Parsons,[1] in a valuable address on medicine and psychology, points out that "the scientific study of the behaviour of human beings has been neglected by the medical profession." Medical students are compelled to spend years in acquiring a knowledge of the structure and functions of the human body, but are left with little or no instruction in the activities of the mind which the body subserves. No one would dream of teaching pathology without a preliminary course of physiology, yet every doctor is daily called upon to treat neuroses and psychoses with inadequate training. If medical students are taught psychology it should be by a more real and vital psychology based upon behaviouristic, biological, physiological, psycho-pathological, and sociological foundations, and the teacher should be a medical man who has acquired a thorough theoretical and practical knowledge of these subjects.

Formerly the subject-matter of psychology was almost entirely limited to what was called the content of "consciousness"—that is, to the thoughts and feelings of which we are fully conscious; its methods consisted of analysing our feelings and thoughts, and from them generalizing the feelings and thoughts of the human mind generally. This is the introspective method of analysis of mind; more and more

it is being realized that the behaviouristic method, applied primarily to animals and secondly to man, affords a far more sound approach to the vital problems awaiting solution. It must be admitted that introspective psychology is the final court of appeal, because, as Stout[2] says:

"All depends on accurate resolution of his own complex consciousness into its constituents and on recompounding these in such a way and in such proportions as to explain the nature and order of the signs which indicate to him the mental processes of others."

But consciousness is too narrow, for, owing to Freud and Jung's researches, the great importance of the unconscious in the study of mental processes has been demonstrated. This new psychology of psycho-analysis has created a widespread demand for instruction in psycho-pathology, but, as Sir J. H. Parsons truly says, "Freudism has been elevated into a cult, its truths have been overlaid with speculation, and the unconscious usurped an autonomy which it is scarcely likely to maintain."

THE INBORN FOUNDATIONS OF CHARACTER.

The dispositions impressed by nature are, in their order of evolution, species, sex, race, and family ancestry. Their ontogenesis is in great measure a recapitulation of their phylogenesis.

1. *Dispositions Impressed by Species.*

"The life of a species is relatively continuous; from generation to generation it animates a fresh collection of individuals. They are the vessels of life, always being renewed, the old ones passing away, the new ones rising into existence; the life of the species is the only life that lasts. The lives of individuals are but passing phases of it." I may here remark that the grasping reflex of the newborn child is an illustration of a pre-organized neuro-muscular reflex mechanism reminiscent of its ape-like ancestry.

2. *Dispositions Impressed by Sex.*

Human motives and conduct originate not only in the desires necessary for self-preservation but also in great measure from the depths of the passion engendered by the natural attraction of the sexes necessary for the procreation of the species.

In respect to the dispositions impressed by sex we know that every cell of the body possesses both male and female characters, but the male characters are dominant; Nature provides in the internal secretion of the interstitial gland of each sex a means of determining the specific characters of body and mind for either sex. Before birth and for some months after, the testis contains the interstitial cells; they, having fulfilled their function of fixing the male characters, disappear until the period of puberty, when they reappear. Observation and experiment show that the secretion of these cells determines the secondary physical and mental male sexual characters. In the female soon after birth Graafian follicles develop from the primordial follicles, and though these follicles do not undergo dehiscence their formation leads to the development of the internal thecal cells, the secretion of which maintains the dominance of the female characters in the cells of the body. Removal of the ovaries in hen pullets shows that the male characters are dominant, for these birds thus operated upon grow up so as to be indistinguishable from cockerels, with spurs and comb; moreover, they behave as cockerels. Again, the effects in behaviour by numbers of experiments on animals and castration in man show the important influence of the sexual organs in the development of body and mind.

The specialization of the difference in sex characters becomes evident as the reproductive organs gradually mature after puberty. The various devices impressed by Nature, for example, display characteristics of each sex leading to attraction of the sexes. The evolution of the specific sex characters is all-important in the development of the sentiments and passions. The sex instinct is the great urge of adolescence; it is the *élan vital* of Bergson; or, as the Freudians term it, the "libido," found throughout organic nature. The *joie de vivre* accompanying it is poetically expressed by Romeo when the love of Juliet urges him to say:

> "My bosom's lord sits lightly in his throne;
> And, all this day, an unaccustomed spirit
> Lifts me above the ground with cheerful thoughts."

We may contrast this with the soliloquy of the intellectual but melancholic, introspective Hamlet, who says:

"I have of late (but wherefore I know not) lost all my mirth, foregone all custom of exercises; and indeed it goes so heavily with my disposition that this goodly frame, the earth, seems to me a sterile promontory; this most excellent canopy, the air, look you, this brave o'erhanging firmament, this majestical roof fretted with golden fire, why it appears no other thing to me than a foul and pestilent congregation of vapours."

3. *Dispositions Impressed by Race.*

Everyone knows the great influence race has upon character; and McDougall in a recent interesting work has shown how very little fundamental racial dispositions are influenced by environment. The great difficulty in determining whether racial characters can be modified by environment is that few races are pure; another difficulty is to find a pure race that has been subjected to similar environmental conditions for a sufficient period of time to impress by natural selection and survival of the fittest a change in disposition. The Jews afford the best instance of a pure race whose history is known since they were an agricultural, pastoral, and warlike people. The remarkable description of the Jew by Nietzsche in *The Dawn of Day*, which I will quote, affords an explanation.

"One of the spectacles which the next century will invite us to witness is the decision regarding the fate of the European Jews. It is quite obvious now they have cast their die and crossed their Rubicon; the only thing that remains for them is either to become masters of Europe or to lose Europe as they once centuries ago lost Egypt, where they were confronted by similar alternatives. In Europe, however, they have gone through a schooling of eighteen centuries such as no other nation has ever undergone, and the experiences of this dreadful probation have benefited not only the Jewish community, but even to a greater extent the individual. As a consequence of this the resourcefulness of the modern Jews both in mind and soul is extraordinary. Amongst all the inhabitants of Europe it is the Jews least of all who try to escape from any deep distress by recourse to drink or to suicide, as other less gifted people are prone to do. Every Jew can find in the history of his own family a long record of instances of the greatest coolness and perseverance amid difficulties and dreadful situations, an artful cunning in fighting with misfortune and hazard. And above all, it is their bravery under the cloak of wretched submission, their heroic *spernere se sperni* that surpasses the virtues of all the saints. People wished to make them contemptible by treating them contemptibly for nearly twenty centuries, and refusing them access to all honourable positions and dignities, and by pushing them further down into the meaner trades, and under this process indeed they have not become any cleaner, but not contemptible. They have never ceased for a moment from believing themselves qualified for the very highest functions, nor have the virtues of their sufferings ever ceased to adorn them. Their manner of honouring their parents and their children, the rationality of their marriages and marriage customs, distinguish them amongst all Europeans. Besides this, they have been able to create for themselves a sense of power and eternal vengeance from the very trades that were left to them (or to which they were abandoned). Even in palliation of their usury we cannot help saying that without this occasional, pleasant, and useful torture inflicted on their scorners, they would have experienced difficulty in preserving their self-respect for so long. For our self-respect depends upon our ability in making reprisals in both good and evil things. Nevertheless, their revenge never urges them on too far, for they all have that liberty of mind, and even of soul, produced in men by frequent change of place, climate, and customs, of neighbours or oppressors; they possess by far the greatest experience in all human intercourse, and even in their passions they exercise the caution which this experience has developed in them. They are so certain of their intellectual versatility and shrewdness that they never, even when reduced to the direst straits, have to earn their bread by manual labour as common workmen, porters, or farm hands. In their manners we can still see they have never been inspired by chivalrous and noble feelings, or that their bodies have ever been girt with fine weapons; a certain obtrusiveness alternates with a submissiveness which is often tender and almost always painful. . . . Europe may some day fall into their hands like a ripe fruit, if they do not clutch at it too eagerly."

It appears as if Nietzsche's prophecy is likely soon to come true.

We cannot think that even twenty centuries have changed the bodily condition of the Jew or even his mentality in its fundamental characters, but the highest psychic level of the brain which has been latest developed evolutionally (being the most plastic) is the most capable therefore of being modified in its modes of adjustment to environment. Only those Jews who were possessed of the highest mental faculties and capacity of making new adjustments in the struggle for existence during this long period of adversity have survived. It may be assumed that quickness of apperception

and readiness to seize opportunities have developed a high degree of racial plasticity of the cerebral cortex in connexion with its evolutionally latest functions associated with the social instinct—an instinct which by natural selection and survival of the fittest in the course of eighteen centuries of persecution has taken on certain specific racial characters described by Nietzsche. But this high degree of plasticity is necessarily associated with a greater liability to mental instability, and I believe this more than intermarriage is responsible for the high percentage of psycho-neuroses and psychoses in Jewish stocks, often, however, associated with genius or great talents in the arts and sciences.

4. *Dispositions Impressed by Familial Ancestry.*

"Like tends to beget like."

All the broad facts concerning dispositions impressed by familial ancestry were known to the ancients, as is clearly shown by the poet and philosopher Lucretius, who in *De Rerum Natura* says:

"Sometimes, too, the children may spring up like the grandfathers, and often resemble the forms of their grandfathers' fathers, because the parents often keep concealed in their bodies many first beginnings mixed in many ways, which first proceeding from the original stock, one father hands down to the next father, and then proceeding from these, Venus produces forms after a manifold chance, and repeats not only the features but the voice and hair of the forefathers; and the female sex equally springs from the father's, and males go forth equally from the mother's body, since these distinctions no more proceed from the fixed seed of one or other parent than our face and bodies and limbs. Again, we perceive that the mind is begotten along with the body and grows old along with it."

It was the custom, you remember, of noble Romans to carry in their triumphant processions the masks of their ancestors, consequently many of these facts became apparent to them.

A study of numbers of pedigrees has clearly demonstrated the fact that it is necessary in the study of hereditary mental dispositions to ascertain the presence or absence of a neuropathic tendency in all the members of the parental stocks. A neuropathic tendency may show itself in many ways—for example, eccentricity, genius, insanity, hysteria, epilepsy, neurasthenia. These mental dispositions may, like bodily conditions, be transmitted. It follows, therefore, that fundamental mental dispositions are likewise inherited.

The Raw Material of Character.

The raw material of character is a complex of dispositions impressed upon the individual by sex, species, race, and ancestry, giving each individual a specific predetermined plasticity to receive and store certain impressions and react to them in a particular way. This raw material of inheritance, upon which psycho-physical energy, durability, educability, imagination, temper (for example, sanguine, phlegmatic, irascible, timorous, melancholic), emotivity, moral sense and aesthetic sense, upon which personality so largely depends, is inborn. That these fundamental dispositions of mind are begotten with the body, and predetermine in great measure character and conduct, was clearly proved by the results of Francis Galton's inquiry into the history of similar and dissimilar twins, which showed that dissimilar twins remained dissimilar in mental and bodily characters although brought up together under the same conditions, while similar twins brought up in different environment remained similar in mental and bodily characters.

A good raw material inheritance requisite for survival in the struggle for existence postulates an adequate combination of mental energy and mental sagacity. Nurture can exercise a marked influence on the development of mental energy by ensuring bodily health and strength during development, and by education and upbringing in a healthy mental environment it can develop, without wasting mental energy, the inborn potentialities essential for efficiency in the struggle for existence. Nurture, however favourable, cannot give mental sagacity if it is not inborn, nor can it do more than bring out the good qualities that the raw material of inheritance has provided; but it must be remembered that nurture plays an all-important part in the preservation or the spoiling of good raw material in all classes and grades of society. However paradoxical it may seem, nevertheless it is true that the inborn virtue of an unselfish, confiding, amiable, and optimistic nature may be the cause of an acquired vicious character under the influence of evil suggestion and imitation; whereas a calculating, suspicious, and selfish nature under similar circumstances would escape contamination.

"Virtue itself turns vice, being misapplied,
And vice sometime 's by action dignified."
Romeo and Juliet.

Inborn Qualities in Relation to Mental and Nervous Diseases.

If inborn good qualities are deficient or absent there will be, in spite of favourable environment after birth, intellectual, aesthetic, or moral feeble-mindedness of various forms and gradations, which in extreme cases can be shown by defective development of the brain, the organ of mind. If there be inherited a disproportion and lack of harmony and integration of these inborn factors of the raw material in a family or stock, upon which mentality is based, an unbalanced mind is likely to develop in one or more members of the family or stock, which will show itself in various departures in conduct from that of the normal stable individual; it may be in the form of eccentricity, of fanaticism, of mysticism, of insanity, of genius, for, as Dryden said,

"Great wits are sure to madness near allied,
And thin partitions do their bounds divide."

Again, the unbalanced mind may show itself in the form of such neuroses as hysteria, neurasthenia, epilepsy, or in one of the forms of the true insanities. The etiology of the psycho-neuroses and psychoses and their clinical symptomatology point to the fact that they belong to one great group.

The Neuropathic Inheritance.

There are individuals born of sound stocks that no acquired conditions—for example, drink, poisons engendered within the body or taken from without, head injuries, emotional shock, distress, and even profound misery and destitution combined—can render insane. A striking fact of this was shown in a report of Bonhoeffer, who had charge of 10,000 Serbian prisoners who had been subjected to every form of stress from disease, famine, and hardships of every kind, yet there were only five insane among them. There are others, generally from a neuropathic stock, whose mental equilibrium may be disturbed by any one of these conditions of stress, or, very frequently, without any apparent cause except the conditions appertaining to the sexual functions and reproduction in adolescence, and the puerperium and the climacteric period in women.

A careful inquiry into the family histories of the progenitors and the collateral members of ancestral stocks will in the great majority of cases show that a child born sound in mind and body is begotten by parents sound in mind and body themselves, whose stocks are free from any neuropathic or physical taint. Such a child with a good inheritance is very unlikely to suffer in later life with feeble-mindedness, epilepsy, insanity, or functional nervous disease. Occasionally, however, from some inexplicable cause parents of sound stocks may beget an idiot or imbecile child, or a child who in later life becomes insane or epileptic. In some of these cases there is a history of insanity or neurosis in grandparents or in collaterals.

The child may give evidence of mental defect by being dull and backward in learning, or it may exhibit fits of uncontrollable temper without cause, or other signs of nervous irritability, such as convulsive attacks, which may be precursors of true epilepsy or of dementia praecox. If the child escapes any distinct morbid manifestation during childhood there is a danger of its showing vicious tendencies later, or developing insanity or epilepsy at the period of adolescence when the sexual instinct is aroused and new desires and passions stimulate the brain to a new activity.

Natural Selection and Survival of the Fittest.

Dr. John Macpherson[3] has shown that the psycho-neuroses and psychoses are found in primitive people, in savages, and in all civilized nations in different parts of the world. The symptoms have a local coloration according to the beliefs, customs, usages, and traditions of the people, but they are essentially similar and doubtless have a similar causation. We may not know what this bodily causal condition is, but the clinical signs and symptoms point to its being some process causing disorder of the latest developed structure of the brain—the cerebral cortex. In cases where the psychosis terminates in a progressive dementia an organic disease of this structure is found, which would account for the symptoms.

In the primary dementia of adolescence there is a degeneration of the cortical neurones which would account for the disintegration of the psychic unity, and I have shown that associated with this is a regressive atrophy of the reproductive organs. These are obvious bodily changes, but it is probable that there is throughout the body a defective vitality—*élan vital*. There is certainly a lowered resistance to disease, as shown by the evidence of deficient oxidation processes.

I have found, by a study of the age of onset of insanity of parents and offspring in over 4,000 relatives who are at present or have been in the London asylums, a signal tendency of the offspring of insane parents to develop signs of insanity in adolescence. The average age of the parents is about 17 years more than that of the offspring. This accords with Darwin's law of Antedating or Anticipation. Those individuals who suffered with dementia in adolescence would have little chance of surviving the struggle for existence among primitive people and savages. Among civilized people insanity leads to segregation, and thus prevents propagation. The regressive atrophy of the testes in males would also interfere with propagation. Again, females predisposed by hereditary tendency break down in adolescence under the stress of normal physiological conditions, such as pregnancy, parturition, or lactation. These cases of so-called puerperal mania often terminate in dementia, and we find in them a regressive atrophy of the ovaries. Only about 10 per cent. of the primary dementia female cases in asylums are married women, and very few of these have had more than one or two children. If it were not for this natural process of preservation from breeding of such unsound members of a stock by bringing the disease on at an earlier age and in an incurable form, racial degeneracy and extinction would be inevitable in a civilization where altruistic sentiment has interfered with the struggle for existence and survival of the mentally and physically fittest.

The Effect on the Individual of the Social Instinct.

The three primal instincts, common to men and animals, of self-preservation, propagation, and the instinct of the herd, are the springs from which the streams and rivers of mental activity have their source. The bond of union of the herd is based upon the willingness of each member to sacrifice self-interest, and even life, for the common good, and by thus doing directly ensuring the preservation of the species, and indirectly the individual. The herd instinct has played a most important part in peace and war; in fact, the history of nations has depended upon it. This gregarious instinct has been the great stabilizing force in the fixation of traditions, customs, and social usages of successive civilizations in the world's history. Patriotism, moral, and discipline have their roots in this instinct, yet every successive age has shown that progress in religions, ethics, the arts and sciences, has originated in men and women with a belief in their individual mentality—so strong, indeed, that they were willing to court death, torture, or exile in their endeavour to overthrow traditional dogma and superstitions, or to incur disapprobation by not conforming to the traditions, customs, and social usages of the herd. Patriots, preachers, prophets, philosophers, artists, and scientists have in all ages and in all civilizations, at one time or another, been regarded by the herd either as bad men or mad men when, inspired by imagination and courage of conviction, they have refused to admit the truth of the accepted doctrines of the society in which they lived. What an inestimable benefit such men have conferred upon mankind, for have they not made the world's history and averted a petrified civilization? A just balance between the influence of the independent original and imaginative mind of the few, and the stabilizing influence of the collective mind of the many, is the secret of social progress and the building up of a sane social heritage. Mental hygiene should, then, be largely concerned in ensuring this just balance by encouraging all those factors and conditions in education which support moral, discipline, self-sacrifice, and esprit de corps, in the home by respect and pride of family, and in schools, universities, in the services, and in industries by respect and pride of such institutions. But it must be effected without repressing or destroying that individual self-control and independent originality in thought and purposive action which is essential for national progress. All games of skill in which the individual plays not for himself, but the side, such as cricket and football, foster the right spirit, and tend to an establishment of a code of honour in which the amour-propre is centred not in the individual, but in the school or university. It must be remembered that man by this herd instinct is eminently imitative, and therefore suggestible to good or bad influences. We can therefore understand the important part esprit de corps plays in the regiment, the ship, or the factory. The great value of esprit de corps, discipline, and moral was strikingly shown in the retreat from Mons of the Expeditionary Force. Again it was shown by the fact that the proportion of cases of shell shock and war neurosis in great measure directly depended upon the moral, discipline, and esprit de corps of the regiment, because these stabilizing forces of the group mind were always operating against individual fear and collective imitation by suggestion.

PSYCHOTHERAPY IN MEDICAL PRACTICE.

Medical practitioners are now realizing that the successful treatment of a vast number of patients suffering with mental and bodily disease depends largely upon the practical study of individual and social psychology. The war has borne home to us how important it is to know the nature, inborn disposition, upbringing, education, conduct, and nurture of the individual. No one has a better opportunity of acquiring that knowledge and utilizing it than the family practitioner, who by his sympathy and sound judgement has become the friend and adviser of the family. To him the patient can come, not only for the relief of his bodily pains and disease, but for relief of his mental troubles and anxieties, which are so frequently the source of the bodily disorder. I always make it a point of asking, Have you any financial difficulties? Have you any domestic difficulties? Have you anything troubling your mind which prevents natural sleep? Do you have dreams? Are they of a terrifying nature or directly or indirectly related to the sex instinct? It is a matter of experience and tact to obtain the information required, especially in matters relating to a mental conflict with a sexual basis. Great care must be taken not to put into the mind ideas of sexual perversion, although great benefit to an afflicted conscience can be effected by explaining the physiological processes of sex, and calming apprehension relating to masturbation and impotence. A practitioner who has inspired confidence will often do more to cure some of his cases of functional neuroses with attendant bodily ailments by helping to remove anxiety and its attendant depression than by medicines. Moreover, he may be consulted by parents in the upbringing and education of children, not only from the physical but the mental side.

There is an ever-growing disharmony between the physiological conditions of the sex instinct and sociological conditions. The non-gratification of this instinctive desire may be the source of a mental conflict accompanied by fear and anxiety in a large number of men and women, especially the latter. It must be a constant experience of the members of this Association to find in the history and behaviour a sexual basis for the mental trouble of their patients who are suffering from either a psycho-neurosis (for example, hysteria, hypochondriasis, or neurasthenia) or a psychosis (for example, religious mania, manic-depressive insanity, involutional melancholia, or primary dementia).

While fully admitting the fact that the study of dreams and psycho-analysis by word association, or by free association, can lead to the discovery and uprooting of a repressed mental complex of a painful nature, or of a nature which would by society be considered wicked, yet I am of opinion that there are but few doctors who possess, or who can possess, all the necessary qualifications of experience, knowledge of technique, high moral principles, tact, and delicacy of feeling to carry out successfully the psycho-analytical methods of Freud and Jung. Human beings, especially women, are suggestible, and the class of people who seek relief on account of psycho-neuroses are eminently suggestible; consequently, unless the greatest care is taken, instead of the treatment being remedial, new and worse conflicts may be installed in the mind. It has always seemed to me that the literature relating to the truths in the new psychology of the unconscious has been deprived of much of its general practical utility by enshrouding it with mythological, mystical, atavistic speculations, and pornographic and coprologic details. Such literature has been not only eagerly seized upon by pseudo-scientists who practise psycho analysis after their own fashion, but also seized upon and read by a section of the general public impelled by curiosity regarding sexual matters. The danger thereby arises of perverted sex ideas being implanted in the minds of such people, causing them to become in some instances antisocial in behaviour.

Introversion of the mind accompanied by contemplative

fear causes loss of voluntary attention to the world around and its diversion to the personality of the individual. The result of this is a disorder of the involuntary automatic functions of the body—a disordered coenaesthesia. Such organs as the heart, the lungs, the stomach, and the intestines, which under normal conditions function automatically with phasic or periodic regularity and without the intervention of attention, now, owing to the effects of introspection and contemplative fear, are disordered in function, and consequently obtrude themselves in consciousness. This causes hypochondriasis and various forms of neurosis.

A local colour of deranged organs gives rise to various types of neurasthenia, and obsessional psychasthenia with phobias. But besides these bodily disorders of the vital functions contemplative fear and anxiety upset the delicate poise of the internal secretions of the reproductive and endocrine glands, the functions of which we are only vaguely conscious of by the bodily effects produced.

An intelligent understanding of the influence of mind on body and body on mind—mental hygiene—and its practical application by the doctor, would avoid recourse of the public to faith healing, Christian Science, the Coué cult, and other forms of treatment by suggestion, which now receive so much popular attention and acclamation.

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THE OUTLOOK OF NEPHRITIS IN CHILDREN.*

BY

HUGH T. ASHBY, B.A., M.D.CAMB., M.R.C.P.LOND.,

PHYSICIAN TO THE MANCHESTER CHILDREN'S HOSPITAL, ETC.

As a general rule cases of nephritis in children do better than in adults; one reason, no doubt, being that the cardiovascular system is in good order, and any rise of blood pressure which may take place has less effect.

The examination of urine in infants is often neglected because of the difficulty in obtaining a specimen. The best way to do this is to put the infant on a mackintosh so arranged that the urine runs into a small pool at the end of the bed. Another way is to hold the infant out after a long sleep.

A simple method of estimating how much urine a child (over 4 years of age) should pass in the twenty-four hours is as follows. The age of the child in years multiplied by two and a half gives the amount in ounces. Thus a child of 6 years will pass about 15 oz. ($6 \times 2\frac{1}{2} = 15$); a child of 12 will pass 30 oz. ($12 \times 2\frac{1}{2} = 30$).

Acute inflammation of the kidneys occurs more often as a secondary than as a primary disease in childhood. Scarlet fever is by far the commonest cause, the nephritis coming on at any time from about the fourteenth to the twenty-sixth day of the disease; it is often impossible to determine the exact date of the commencement of the nephritis, and many cases are the result of mild attacks of scarlet fever not recognized at the time. The severity of the attack of scarlet fever plays no part in the occurrence of nephritis, which may come on after severe and mild attacks alike; often, indeed, the most fatal are those which come on after an attack only recognized by the peeling. It is likely that the patient has not been looked after during the convalescence and has been exposed to cold, etc. In any child under 10 years of age who develops nephritis, scarlet fever should be borne in mind and desquamation looked for very carefully.

The occurrence of nephritis after scarlet fever varies in different epidemics, but it may be roughly estimated at about 10 per cent. The outlook is usually good, and it is rare for the nephritis to become chronic. The amount of albumin in the urine does not seem to alter the outlook, for a case with a large amount may get quite well while one with only a small amount may do badly. The worst cases are those which have remained untreated for some days and in those where there is suppression of urine, as uraemia is liable to occur. The preventive treatment consists in the greatest care being taken during the two and three weeks after the acute onset of scarlet fever, especially as regards catching cold.

Acute nephritis does, however, occur as a primary disease, or at any rate as far as we know. Thus a schoolboy, who had apparently been in good health, was noticed by his parents to be puffy in the face one morning, and on examination a large quantity of albumin was found in the urine.

Unlike the post-scarlatinal nephritis, the outlook is mostly bad in these insidious cases. They run a course of perhaps three months to two years, but complete restoration to health does not often occur. The child may get fairly well, but he is liable to further attacks, which damage the kidneys still more, till he grows waterlogged and dies. Towards the end very little urine is passed, and dyspnoea becomes a very marked feature, so that the patient has to be propped up in bed. Uraemic convulsions are also common.

It is, however, often difficult to give a prognosis, which is what the relatives want to know. The prognosis depends on (1) the general condition of the patient; (2) whether the nephritis is post-scarlatinal or idiopathic; (3) the results of the renal function tests, etc., the chief being for the ordinary man the urea concentration test.

Recently the renal efficiency test has been elaborated by Maclean and de Wesselow, of St. Thomas's Hospital. It is simple, needs no clinical laboratory, and from my own experience gives reliable information as to the state and efficiency of the kidneys. Until lately the condition of the kidneys of patients suffering from nephritis was judged solely by the amount of albumin and by the presence of casts. Now, a large amount of albumin does not necessarily mean that the outlook is bad; nor is the converse true, for a patient with a small amount of albumin may do badly.

This is where the urea concentration test or renal efficiency test is useful. It depends upon the fact that when a large dose of urea is administered to a patient with defective kidneys he is incapable of excreting urine with a high urea concentration. The Ministry of Pensions has used this test to assist in assessing patients for pensions. The details of the test are as follows:

Renal Efficiency Test.

Starting at a convenient time, say 8 a.m., the child empties his bladder and immediately afterwards takes 10 grams of urea (15 grams for an adult) dissolved in about 3 oz. of water, flavoured with tincture of orange. The urea solution is not unpleasant to take, and there is seldom any difficulty.

At 9 a.m., or an hour later, he passes urine.

At 10 a.m., or two hours later, he passes urine again, and this specimen is kept for the estimation of urea.

The test is easily carried out, the urea being estimated by the hypobromite method and an apparatus which gives the volume of gas evolved. The apparatus can be bought complete, or it can be arranged by oneself. The percentage of urea equivalent to the amount of gas evolved may be ascertained from a table.

If the percentage of urea after the test exceeds 2 the kidneys are fairly efficient, but if below 2 their condition is unsatisfactory. The test can be carried out each week during an illness, and we can see how the kidneys improve or otherwise. The general reliability of the test and its ease of application (it takes about three minutes) should make it of great assistance in clinical medicine, and also in certain surgical conditions, such as prostate and kidney cases.

Again, if it is suggested that a patient with chronic nephritis should undergo an operation, we can, after performing the test, say whether the nephritis precludes it. There is also the test where the blood urea is estimated, but the test is beyond the scope of anyone who is not a trained pathologist.

Little need be said of the general treatment of nephritis until we come to the question of diet. It is clear that in the past we have restricted the diet too much, especially in the amount of protein allowed. Everyone needs a certain amount of protein to keep in good health. If very little or no protein is given in the food the body itself will supply waste products, so that we cannot eliminate altogether the work of the kidneys. There is no retention of nitrogenous products in a case passing albumin in the urine, and therefore there is no need to restrict the diet. Again, there is a large loss of protein each day, and all the more reason for giving a liberal supply in the food to make good this loss. When protein is given in the diet the amount of albumin in the urine is not increased and often diminishes.

A high protein diet is the best means we have of relieving a patient who has much dropsy from nephritis, and helps to make him more comfortable. This is most probably to be explained on the ground that the protein diet raises the urea percentage in the blood and so causes a diuresis, for urea is

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one of the best diuretics we have. A dose of urea, 10 to 15 grams each morning, will often get rid of obstinate oedema.

It should be noted that there is no excess of urea in the blood during uraemia; if there were there would be a good diuresis and no uraemic convulsions.

To sum up, I would advise that a patient with nephritis should have a slop diet for about ten days, and that the diet should gradually be increased to include fish, eggs, and meat, although there is still albuminuria. Also do not keep a nephritic patient in bed too long. A certain amount of exercise in a warm room helps to lessen the oedema, besides giving the child a happier time.

IONIC MEDICATION.

BY

DAVID CAMPBELL, M.C., M.A., B.Sc., M.B.,

FOLLOK LECTURER IN MATERIA MEDICA AND PHARMACOLOGY, UNIVERSITY OF GLASGOW; PHYSICIAN TO OUT-PATIENTS, WESTERN INFIRMARY, GLASGOW.

THAT particular branch of therapeutics known as ionic medication or ionization is one about which very little information can be obtained in any recognized textbook of pharmacology and therapeutics. Yet the subject is not a new one. Lewis Jones states that Leduc, in one of his publications, gives references to a great many papers on the subject, and mentions one published in 1833.[1] Turrell goes even farther back and declares that the theory of ionic medication was enunciated by Verratti in 1747.[2] The general application of this theory as a practical question in therapeutics appears, however, to date from the publication of a series of papers by Leduc in 1900. In spite of this most textbooks ignore the subject. A few mention that there is such a method of treatment, but offer little or no criticism of its efficacy.

The reason for this reticence on the part of authors is fairly obvious. The majority of those who practise this method of treatment acclaim with enthusiasm the wonderful results which follow. Those who criticize it exhibit an almost equal degree of vehemence in their condemnation. It is difficult for the therapeutist, who may have little or no practical experience of the method, to know where the truth lies. It seemed to me, therefore, that it might serve a useful purpose to undertake a critical examination of the whole subject, basing my views on a considerable number of experiments and clinical observations.

The first difficulty which arises is in the definition of the term "ionic medication." According to those who speak with authority on the subject the term embraces (1) the introduction of drugs into the body through the skin or a mucous surface by means of an electric current, and (2) the modification of the chemical composition of parts of the body by the setting up of chemical changes throughout the tissues.[3] If the second part of the definition means that the chemical composition of the tissues is modified by the drugs introduced, then it is understandable. If, however, as is generally held, it means that this modification is the result of the passage of a current through the body, without any reference to the drug introduced, it is very difficult to see how this process can be termed "medication." It is obvious, in any case, that the two parts of the definition involve quite different conceptions, and will require to be considered separately.

The first question therefore which has to be considered is: Can drugs be introduced through the skin by means of an electric current? The answer to that question is undoubtedly in the affirmative. In animals Leduc showed that it was possible to introduce strychnine ions through the skin of a rabbit in this way.[4] Finzi proved that the ferri-cyanide ion could be carried through the skin of a monkey.[5] Inchley repeated these experiments on cats, rabbits, and guinea-pigs, and showed further that it was possible to introduce a number of other alkaloids, some metals, and certain negative ions.[6] In man exact records of experiments are few, though numerous writers have mentioned that it is possible to prove the penetration of the iodine ion. In my experiments I have been able to confirm this, and I have further been able to demonstrate quite conclusively the presence in the body of another anion, the salicylic ion, and of two kations, pilocarpine and atropine, after they have been carried through the human skin by a current of electricity.

The next question is: Has the ion thus introduced into the body any special pharmacological action in virtue of its being so introduced? If we are to believe the ionic theory of the action of drugs—namely, that soluble salts exist in the body mainly as ions, and that each ion possesses an independent pharmacological action—then we must believe that the method of administration will make no difference to its intrinsic action. That this is so has been shown by the experiments of Leduc and Inchley on animals. The strychnine ion introduced electrically exhibited its ordinary action on the spinal cord and caused convulsions, while the atropine ion exhibited its ordinary action by producing paralysis of the cranial autonomic nerves. In man it can be shown quite easily by using a solution of pilocarpine nitrate underneath the positive pole. After the current has passed for some time the individual exhibits salivation, sweating, and disturbance of vision—in other words, the ordinary signs of the action of the pilocarpine ion. It may seem that I elaborate this point rather unnecessarily, but the suggestion has frequently been made, or at any rate implied, that by introducing an ion through the skin by means of an electric current you thereby endow it with some peculiar properties. That this is not so is obvious. The essential pharmacological action of any particular ion is the same whether it be passed through the skin into the body by inunction, a hypodermic needle, or an electric current.

If that be so the critic will very naturally ask: Wherein lies the particular merit of this method of introducing drugs into the body? The technique is expensive, complicated, and wasteful of valuable drugs, compared at any rate with the hypodermic needle or inunction. What advantages does it possess to compensate for these very obvious drawbacks? The answer is given that "In treatment by ionization a cloud of ions is introduced into the place where the disease exists"[7]; that the ions are limited to the diseased region, and that therefore the local concentration is high. As a result the action is more intense, and the effect consequently greater.

If we examine these statements we must inquire: (*a*) What quantity of drug can be passed through the human skin by means of the currents used for therapeutic purposes? (*b*) What evidence is there of a local concentration of the drug? (*c*) How deeply can the drug be made to penetrate in this way?

I have investigated the first question with special reference to the iodine and salicylic ions, which are the two remedies most extensively employed in the treatment of medical conditions in this way. The method adopted was to "ionize" a number of patients, using a 2 per cent. solution of potassium iodide or sodium salicylate under the negative electrode. The process was continued for a period of thirty to forty minutes, and the urine was collected for analysis during the twenty-four hours following the experiment. The method described by Kendall[8] was employed to estimate the amount of iodine present in the urine, and the amount of salicyl bodies was estimated by Hanzlik's method.[9] The following table gives the results when potassium iodide was used.

Current in milliampères	25	50	100	200
Milligrams of iodine in 24 hours' urine	30	55	98	146

It must be pointed out, of course, that it is not possible to raise the current all at once to the amperage indicated. For the comfort of the patient that has to be done gradually, and accordingly the currents mentioned were not acting during the whole period of the experiment. The rapidity with which the current could be raised varied with different individuals, but the quantities of iodine noted in the table were the maximum found for each particular current. In the case of the current of 200 ma. the duration of the experiment was forty minutes, the current being raised from 100 to 200 ma. during the last thirty minutes of the period. The duration in the other cases was thirty minutes.

It is known that from 60 to 80 per cent. of the amount of iodide taken into the body by any channel is excreted in the urine in twenty-four hours. From the figures given it is possible therefore to estimate approximately the amount of the iodine ion which has entered the body. Taking even the lowest percentage, the maximum amount of iodine which was introduced into the body by each current was 50, 92, 160, and 243 mg. respectively. In other words, it will be seen that, with the ordinary currents used in therapeutics, and for the ordinary duration of treatment, the total amount of iodine introduced was not greater than 0.77 grain, 1.4 grains, and

2.46 grains. Even with the huge current of 200 ma. the amount was only 3.74 grains.

When sodium salicylate was used the amount of salicyl bodies excreted in the urine, after the employment of ordinary currents, was so small that it could not be estimated with any degree of accuracy. Using a current rising to 170 ma. during a thirty-minute period, the total amount of salicyl bodies found in the urine was only 9 mg. It is interesting to note that this result coincides with that of Inchley, using a cat as the subject of experiment.[6] He found only very small amounts of salicyl bodies in the urine, and comments on the fact that the salicylic ion is not carried through the skin to the extent that enthusiastic writers on the subject would lead one to suppose.

Objection may be taken to this process of reasoning. It may be argued that the amount excreted would give no true indication of the amount passed through the skin. The objection has very little weight, but it can easily be overcome by considering the results when pilocarpine nitrate and atropine sulphate were used. With pilocarpine nitrate, using a current rising to 50 ma. over a period of twenty minutes, there was produced in the subject of the experiment salivation, sweating, and slight disturbance of vision. All these effects could be produced on the subject and to the same degree by injecting 1/5 grain hypodermically. In the case of atropine sulphate it was not considered advisable to use large currents because of the poisonous effects of very small quantities of that drug. But using a current of 5 ma. for thirty minutes resulted in sufficient atropine being introduced to produce a rapid pulse (135 a minute), marked dryness of the mouth and throat, and paralysis of accommodation lasting for eighteen hours. All these symptoms could be produced by injecting hypodermically 1/30 grain of atropine sulphate. In these experiments the amount of the drug introduced into the body was estimated, not from the amount excreted, but by its physiological action, and in each case it will be seen that this amount was small. It will be noted, further, that the action of these drugs differed in no way from what is seen when they are given hypodermically.

While the salient feature of all these results is that the amount of drug introduced is very small, there was another feature which is of considerable importance and which bears on the question of local concentration. In "ionizing" a patient with potassium iodide it was possible to demonstrate iodine in the saliva collected during the first twenty minutes of the period of treatment. Again, when pilocarpine nitrate was used, salivation made its appearance twelve minutes after the current was started; exactly the same time as after hypodermic injection. Where, then, is the evidence of local concentration? It must be quite obvious that as soon as the ion is carried through the skin it is whisked off in the blood stream and that therefore no local concentration ever takes place. Otherwise how is it possible to explain its appearance so quickly in parts of the body so far removed from the seat of entry, and in such amounts as to produce its physiological action on these parts?

The next question to consider is the depth of penetration of the ions. In man it is difficult to produce any experimental evidence to bear on this question, but the discussion in the previous paragraph throws some light upon it. If the ions introduced through the skin appear so rapidly in distant parts of the body, it must be obvious that they are set free from their function of carrying the electric current as soon as they pass through the skin. That they penetrate deeply is therefore unlikely. It should be noted further that although, until it passes the barrier of the skin, the current can be conveyed only by the ions of the solution underneath the electrodes, as soon as this barrier is passed the ions of the body fluids will take on the task of carrying the current. That fact renders even more unlikely deep penetration of the foreign ions introduced. A number of experiments have been related to prove that ions penetrate deeply. These experiments are, however, useless for this purpose. They only show that it is possible for considerable penetration to take place in dead or isolated tissue and in parchment. In the living body there is quite a different state of affairs.

In the few cases where attempts have been made to show deep penetration of ions in man they have signally failed. Finzi, in monkeys, claimed that he had been able to obtain penetration of the ferri-cyanide ion into the knee-joint.[5] Grave doubt has to be cast on this experiment because of the possibility of the ferri-cyanide ion found in the joint being carried there by diffusion after the animal was killed. Finally, Inchley, repeating this experiment on a rabbit, found that there was no deeper penetration into the joint than could be obtained by simple subcutaneous injection of the drug under the skin covering the joint.[6] The whole weight of experimental evidence in living animals goes to show that the penetration of ions is not deeper than the subcutaneous tissue.

It would appear, therefore, that the following statements are true:

1. The amount of any drug introduced in an ionic state into the body by currents which can be used therapeutically is very small.

2. The drug, as soon as it is carried through the skin, is swept away in the blood stream and produces its specific action on the system generally. There is therefore no local concentration.

3. There is no evidence of deep penetration. On the contrary, in animals the experimental evidence is all against the drug penetrating farther than the subcutaneous tissue. In man it seems to be quite clear that a similar state of affairs exists.

We have now to examine the second part of the definition—namely, that in the process of ionization chemical changes are set up in the tissues, and that the resulting modification of the chemical composition of the body produces a therapeutical effect. That statement, as will be obvious, has really nothing to do with medication, but is a claim for the action of a constant current of electricity. An example of this is the claim that there is a "lytic" action underneath the negative electrode, and that this "lytic" action affects principally exudates and recently formed bands of lowly organized tissue.[10] It is quite true that, when an electric current is passing through the body fluids, there will be movement of anions towards the positive pole and of kations towards the negative pole. But it does not follow that any chemical changes are set up in the tissues between the poles. Faraday demonstrated long ago that when a current is passed through a solution of an electrolyte no apparent change occurs in the fluid, and that chemical changes take place only *at* the electrodes. To take a concrete example: when a current is passing through a solution of sodium chloride no chemicae change can be observed in the solution, although the ions are in motion to their respective poles. At the negative electrode the sodium ion will give up its electrical charge, become a sodium atom, and combine with water to form a caustic alkali which will act on any tissue in contact with it. But that is *at* the electrode and, in the cases considered, on the skin. To suggest that any ion of the body fluids can product a "lytic" action on the tissues underneath the skin before it has reached an electrode is manifestly absurd. There can be no "lytic" action except on the skin underneath the negative electrode. Further, it is difficult to conceive, and there is no evidence to suggest, that the mere migration of an ion, which is normally a constituent of the body fluid, to another part of the fluid can cause any chemical change which would have a therapeutical effect.

Certain authorities, recognizing the difficulty of explaining their therapeutical results on the basis of chemical changes in the tissues, have claimed that it is the movement of the ions which is the important factor. They suggest that there is a bombardment of millions of tissue ions on the affected part and that this "ionic massage" may be of benefit. In the present state of our knowledge of the forces bound up in matter it is hardly worth while discussing such a hypothesis. Two facts, however, are worth mentioning: (1) Though the number of ions set in motion must be enormous, the total mass of ions acting on any part must be very small; (2) the greatest migration velocity of any ion, the hydrogen ion, with a potential gradient of one volt per centimetre is only 0.0032 cm. a second.[11] It is difficult to see how a "bombardment" carried on by a small mass moving so slowly can have much effect. It can be in no way comparable to massage at the hands of a well trained and intelligent expert.

In view of these facts I have endeavoured to examine closely the therapeutical value of this method of treatment in a number of cases in the Western Infirmary, Glasgow. Potassium iodide and sodium salicylate, each in 2 per cent. solution, were the drugs used, and the cases which were treated were patients suffering from fibrositis of the lumbar and other regions, sciatica, and rheumatoid arthritis. As a general rule currents up to 100 ma. for thirty to forty-five minutes were employed; in one case a current of 170 ma. was reached during the last ten minutes of a thirty-minute period of treatment. The results can be briefly summarized. In no case was there any real benefit. The results agree with those

obtained by Stockman in an extensive investigation of the treatment of the same conditions by ionization. These were not published in detail, but an epitome of them is to be found in his book on *Rheumatism and Arthritis*.[12] Nor could it be expected that it is possible to cure such diseases in this way. For iodides and salicylates can be administered by the mouth in doses sufficient to produce a continuous concentration of iodine or salicylic ions in any part of the body far greater than could possibly be produced by ionization. Further, very much greater quantities of salicylic ions can be passed locally through the skin by applying methyl salicylate, and much greater quantities of iodine ions by applying iothion (di-iodhydroxypropan), an oily liquid having the chemical formula $CH_2I.CHOH.CH_2I$. Yet none of these methods of treatment benefits the conditions mentioned.

Although no real and permanent benefit followed this method of treatment, in a number of cases there was a temporary relief of pain. This relief persisted for some hours after the process of ionization, but in every case the pain returned, though in a few cases not to the same extent. This diminution of pain could in no way be ascribed to the introduction of the iodine or salicylic ions, for an exactly similar diminution of pain was obtained when the current was reversed and therefore no iodine or salicylic ions were being introduced. Similarly, when a pad soaked in a solution of sodium chloride was used over the affected part the same relief was observed.

It would be of interest to inquire as to the particular factor to which this is due. It has been shown conclusively that it is not due to the specific action of any ion. It must be due, therefore, to the galvanic current. Two different factors will thus require to be considered: (1) the current passing between the poles, and (2) the action of the current at the poles. Turrell suggests that the action of the current passing between the poles has the effect of generating an appreciable increase of temperature in the tissues, and to this increase of temperature he ascribes the beneficial result which follows.[13] It is true that Joule's law applies to electrolytes, and that therefore all the energy of the current spent when traversing the electrolyte is used simply in the production of heat, and not in causing chemical changes. But the most of the heat produced in this way is on the skin where the resistance to the current is greatest, while that produced in the tissues underneath the skin is small, is slowly evolved, and is dissipated quickly throughout the body. The experiments Turrell brought forward in support of his view merely showed an increase of the surface temperature of the limb to which the electrodes were applied, and that could quite easily be caused by dilatation of the cutaneous vessels. He admitted further that the more powerful heat-producing action of the diathermy current was not nearly so good as the ordinary galvanic current. His attempt to explain this obvious difficulty is not convincing.

It has to be admitted that the passage of an electric current through the tissues will have a general stimulating effect on them which may be of some benefit. But to me it seems clear that it is the action of the current at the poles which is the chief factor in the relief of pain. In every case treated in this way there is some irritation of the skin under the pads, which is evident from the sensations of the patient and from the marked hyperaemia of the skin seen when the pads are removed. This irritation is produced partly by the electrolysis of the substances in the solution employed to moisten the pads and partly by the stimulating action of the current on the skin, and it is sometimes sufficient to cause a tender part of the skin to remain red for several days. Nor is it necessary to use very large currents to produce this irritation. For, while the amount of irritation varies directly as the current, it varies indirectly as the size of the electrode. It is possible, therefore, to get a considerable amount of irritation even with small currents, if small electrodes be used. Here, then, is the ordinary counter-irritant action. It is difficult to account for the manner in which counter-irritants produce their beneficial effect, but that they do relieve deep-seated pain, at any rate temporarily, is undeniable. It seems to me therefore that, while it is possible that the interpolar current has some general stimulating effect on the tissues underneath the skin, the great factor in producing temporary relief of pain is the counter-irritant action on the skin underneath the electrodes.

So far only the medical aspect of ionization has been discussed. As far as its surgical application is concerned, those who practise this method in the treatment of many different varieties of septic sinuses, lupus nodules, and septic diseases of the vagina and uterus, claim that the results obtained are excellent. I have had no practical experience of its use in these conditions, and can therefore offer no opinion as to its therapeutical efficacy. But, as far as the theory is concerned, attention may be drawn to the following facts. Zinc is the ion which is used in practically all cases. A number of electrotherapeutists use simply a zinc probe, which is put into a sinus, or a zinc sound, which is passed into the uterus, the metal forming in each case the positive electrode. When a current is passed the metal will have a destructive action on any tissue with which it is in contact. The chlorine ions of the tissues will move to the zinc electrode, give up their electrical charges, and the chlorine atoms thus set free will combine with the zinc of the electrode to from nascent zinc chloride. This substance will produce its well recognized caustic action on the tissues and its antiseptic action against any organisms which are present. But that is not "ionic medication." It is simply a method of producing nascent zinc chloride electrolytically in a place where its action may be of value. That a similar state of affairs exists when the zinc rod is placed in a cavity containing a solution of zinc sulphate is most likely, for here there will be constantly produced, electrolytically, nascent zinc sulphate by the sulphuric ions giving up their electrical charges at the zinc electrodes, and the atoms thus formed combining with it. In addition, the irritation of the tissues under the electrode will cause an increased blood supply to the part, which, in the chronic conditions in which ionization is employed, will be of some benefit. That there is any deep penetration of zinc ions is very doubtful, and it is not desirable in view of the powerful coagulating effect which zinc ions have on the albumin of the tissues. It appears to be entirely unnecessary to invoke the conception of the deep penetration of zinc ions in order to explain the therapeutic results which follow ionization. The combined action of the compounds formed electrolytically at the zinc electrode and the irritation of the tissues is quite sufficient to produce all the effects which have been described.

In conclusion, it will be obvious that, if the argument presented above is accurate there is very little scientific basis for the theory of ionic medication, and—as far, at any rate, as the medical aspect is concerned—for the practice thereof. To those who strongly support this theory I may appear guilty of an excess of zeal in attempting to undermine their hypothesis. In defence I can only draw their attention to the words of Claude Bernard: "In science the word criticism is not synonymous with the word disparagement; to criticize means to seek the truth by distinguishing what is true from what is false."

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RHEUMATOID ARTHRITIS TREATED WITH INTRAVENOUS BACILLUS COLI VACCINE.

BY

ROWLAND J. PERKINS, M.D., B.S.LOND., M.R.C.P.,

PHYSICIAN WITH CHARGE OF OUT-PATIENTS, ROYAL WATERLOO HOSPITAL;

AND

G. BRUCE WHITE, M.B., CH.M.SYD.,

LATE HOUSE-PHYSICIAN, ROYAL WATERLOO HOSPITAL.

By rheumatoid arthritis we mean the type of chronic arthritis of infective origin attacking the small and large joints, and characterized by proliferative changes in the ligaments and effusion into the cavity of the joints, and going on to ankylosis. Commonly, this type of case is considered to be of chronic infective origin, the infection arising from some hidden focus in the body, common foci being the teeth, tonsils, alimentary canal, and uro-genital system, the latter being particularly common in women. We wish to draw a distinction between this type of case and the type of osteo-arthritis occurring in old people and characterized by

osteophytic growths and erosion of the articular surfaces, but showing practically no tendency to ankylosis. In this type the changes are rather of a degenerative nature.

Treatment of rheumatoid arthritis may be classified under three headings—namely: (1) Elimination of the focus of infection; (2) increasing the resistance of the patient to the infection; (3) local treatment to the joint—(*a*) to prevent deformity; (*b*) to alleviate pain; (*c*) to preserve movement of the joint.

Frequently, however, the focus of infection is difficult to locate, and, although routine search was made in all cases under our care, in most no such focus could be found. It is in these cases, in which the preparation of the vaccine from the focus of infection was impossible owing to a definite focus being absent, that the protein shock method by the intravenous use of *B. coli* vaccine was employed. Our search for foci of infection was necessarily limited owing to our patients (all except one) being out-patients during the treatment, except when admitted for the actual injection for twenty-four to forty-eight hours.

The normal defences of the body in the average case of rheumatoid arthritis are low, as is shown by the absence of leucocytosis in most cases, even in those in which a pyogenic coccus can be demonstrated in the focus of infection. The object of the protein shock is to make a sudden call on these defences with the idea of arousing them from their apathy. The *B. coli* vaccine was used owing to its being a form of protein suspension convenient to administer, and the material for its preparation is always easily obtainable. Possibly there may also be a specific action as well in some cases, in that *B. coli* may be the infection of some of those in which no focus of infection could be discovered.

The vaccine was given intravenously in doses varying from 50 to 200 millions for a first dose, the patient being admitted for twenty-four hours, as it was considered that the reaction was too severe for the patient safely to remain an out-patient whilst it was in progress. A certain amount of difficulty was experienced in judging a suitable initial dose. This should be as large as possible, and we found that the general condition of the patient was a much better guide to the initial dose than the condition of the joints.

The reaction usually consisted of a rise of temperature occurring a few hours after the injection, the temperature varying from 100° to 103° F., and frequently accompanied by a rigor. Nausea and vomiting may also occur. The duration of the reaction varies from twelve hours to two days. If any improvement as a result of the treatment is to take place it does so rapidly, and, as a rule, within two days, though in one case (F. S.) there was very little immediate improvement, but this occurred three weeks after the injections. If the reaction is too severe it can be checked by giving min. 5 of 1 in 1,000 adrenaline chloride solution intravenously; but in none of our cases did we find this to be necessary. Those cases with the severe reaction showed the best results.

Case 1.

Mrs. W., aged 43. Attended July 10th, 1922, complaining of swelling and pain of finger-joints of eight years' duration. On inquiry she stated that she had slight vaginal discharge.

Examination showed swelling of wrists and finger-joints, and a good deal of tenderness and limitation of movement. Heart: Mitral regurgitation present, but good compensation. Vagina and cervix uteri: No evidence of discharge found, and no cervicitis.

One hundred million *B. coli* vaccine were given intravenously with moderate reaction. Marked improvement followed; pain disappeared, and the swelling diminished considerably; stiffness was, however, still present.

On July 27th 500 million were given with moderate reaction and good result to joints.

The patient still has slight swellings of the joints, but movement is practically normal and painless.

Case 2.

Doris M., aged 26. Attended June 21st, 1922, complaining of pain and swelling in finger-joints for some time, and recently pains in shoulders and knees.

Examination showed early rheumatoid changes in fingers, with swelling and limitation of movement. No swelling, but slight limitation of movement of right shoulder-joint. No oral, nasal, or other septic foci discovered.

On June 26th she was given 100 million *B. coli*. There was a severe reaction, with marked fever (103° F.) for three to four days, intermissions, pallor, asthenia, and sweating. Within twelve hours of the injection there was distinct improvement of the joint condition. The swelling and pain disappeared, and movements became free. Five weeks later there was some return of symptoms, and the patient was readmitted and given 500 million intravenously, with improvement. The patient has remained well since.

Case 3.

F. S., aged 59. Admitted June 6th, 1922, with extremely marked rheumatoid changes of about five years' duration in all the joints of both upper and lower limbs. There was inability to extend the elbows beyond the right angle, practically no movement in wrists, inability to extend knee-joints above 150 degrees; she was unable to walk, but could stand with difficulty. Patient had previously had treatment at various spas, including vaccine treatment, subcutaneously by vaccines from teeth. The teeth were found to be very septic, and marked pyorrhoea was present, but there were no dental abscesses.

Weight extension was applied to the knee-joints, extraction of all teeth was performed, and three doses, of 500 million, 1,000 million, and 2,000 million respectively, of *B. coli* vaccine were given intravenously at intervals of ten days. The reactions were mild, though after the second dose an additional soft swelling appeared in the metacarpo-phalangeal joint of the right index finger, and persisted a few days before disappearing. Immediate improvement in the joints was practically *nil*, but since her discharge considerable improvement has occurred, and when last seen (September, 1922) she could walk moderately well with the aid of two sticks, and she was then able to extend both knee-joints. The pain was less but still persisted; subsequently, however, except for slight recurrences during damp weather, this disappeared.

Case 4.

L. G., aged 37. Attended February 2nd, 1922, complaining of pain and stiffness in fingers and wrists. On examination there was found to be considerable swelling of all the small joints of the hands, with marked stiffness. No Heberden's nodes were present. Some pyorrhoea alveolaris was present in the mouth. Dental sepsis was healed by extraction, and a trial made of potassium iodide and guaiacol carbonate by mouth, with little or no improvement.

On March 30th the patient was given 50 million *B. coli* intravenously. The reaction was slight and consisted of two days' pyrexia. The affected joints became less swollen and freely movable. A relapse occurred about six weeks later, and 150 million were given on April 13th and 250 million on April 18th, the latter dose being given because the former failed to produce sufficient reaction. A slight reaction was produced by the second dose and the results to the joints were good. Since then the joints have remained free from pain and stiffness, but slight spindle-shaped swelling of the fingers persists.

Case 5.

A. R., aged 44. Attended May 4th, 1922, complaining of "rheumatism" for two months. Examination showed rheumatoid arthritis in smaller joints of the hands, oral sepsis, and septic tonsils. The teeth and tonsils were treated by extraction and antiseptic paints respectively, and the patient was given a mixture containing potassium iodide and guaiacol carbonate, but no improvement resulted. She was then given 50 million *B. coli* vaccine intravenously, and there was immediate improvement in the affected joints; the swelling subsided and the pain was relieved. Seven weeks later there was some return of the symptoms, and 200 million *B. coli* were given intravenously and improvement again resulted. Since July 6th the patient has not reported to the hospital.

Case 6.

E. B., aged 52. Attended on February 21st, 1922, complaining of pains in wrists and legs for two months. Examination showed swelling of small joints of hands and right knee; some oedema of ankles present. Some dental sepsis present.

The patient was under treatment for five months with local applications and medicine, and dental sepsis was treated. On June 22nd the patient was admitted and was given 100 million *B. coli* vaccine intravenously, with very good results to the joints and a moderate reaction. Since this the patient has reported fortnightly, and now states that she is practically free from pain, and that, whereas prior to treatment she was unable to dress herself, she can now do so.

Conclusions.

The number of cases under review is small, so that it is premature to draw any hard and fast conclusions. However, though we do not claim in any way that this treatment is a final and lasting cure for the condition, to us the treatment does appear to have definite value, especially as an adjuvant to the more recognized methods of treatment. It is also too early to state whether any benefits that may have resulted are permanent.

We consider it to be indicated under the following conditions: (1) Cases in which no definite focus of infection can be located. (2) Cases in which the more recognized methods have failed. (3) Early cases in which the process in the joints is still active, especially if swelling and effusion be present. Case 3 indicated that little can be hoped for when adhesions are present in the joints.

A great difficulty experienced with the treatment was to estimate the dose of vaccine required to produce a beneficial reaction which would not be too severe for the patient. We are of the opinion that we erred on the side of leniency in this respect and that too small doses were given.

In conclusion, we desire to express our indebtedness to Dr. Woodwark for the loan of beds for our cases during the period of reactions.

FOREIGN BODIES IN THE AIR AND FOOD PASSAGES.

REMARKS ON FIVE CASES.

BY

C. A. SCOTT RIDOUT, M.S.LOND., F.R.C.S.ENG.,

SURGEON TO THE EAR, NOSE, AND THROAT DEPARTMENT OF THE PORTSMOUTH AND SOUTHERN COUNTIES EYE AND EAR HOSPITAL; ASSISTANT SURGEON TO THE ROYAL PORTSMOUTH HOSPITAL.

THE following series of 5 cases of foreign bodies in the air and food passages form an interesting group illustrative of the value of modern treatment for these conditions, and of the necessity of having at hand the most up-to-date instruments for dealing with them; this was shown especially by the one failure to remove the foreign body by endoscopic methods, recourse to the older and cruder surgical method of external incision becoming a necessity.

CASE I.—*Toothplate Impacted in the Right Bronchus.*

J. S., a mechanic aged 22, was referred to the Eye and Ear Hospital by my colleague Mr. Bosworth Wright on October 25th, 1922, with the following history. On October 24th he lay down about 6 p.m. and fell asleep; he woke about an hour later, coughing, and felt pain in the right side of the chest. He then missed his lower toothplate, which contained ten teeth and had one holding hook. Past history elicited that on a few occasions he had suffered from petit mal, becoming unconscious for a short period. The cough and pain in the chest continued, and he went to the Royal Portsmouth Hospital, where by screening with *x* rays a foreign body was located to the right of the middle line of the chest opposite the fifth rib posteriorly. An oesophageal bougie passed easily. He was transferred to my care next day, and on further screening the foreign body was seen in the same place as before to the right of the middle line of the chest, whether screened from front or back. A radiograph confirmed the appearance seen in the screen. Cough was frequent and painful. Loud rhonchi were heard over the centre of the right pulmonary area. It was obvious therefore that a foreign body was present in the right bronchus, but its size (length as seen about 1¼ inches) did not correspond to the description of the missing toothplate, though its contour corresponded to a smaller plate than the one described.

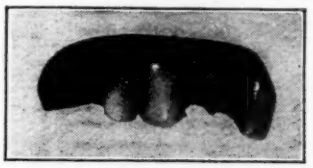


FIG. 1.—Case i: Toothplate, measuring 1¼ inches in length, removed from right bronchus.

The patient was then anaesthetized by Dr. C. Mayhew, anaesthetist to the Eye and Ear Hospital, with a C.E. mixture, after injection of the pre-tracheal tissues with 2 per cent. novocain and adrenaline 1 in 20,000. A deliberate tracheotomy was performed, the second, third, fourth, and fifth tracheal rings being incised after division of the isthmus of the thyroid and injection of 1 per cent. cocaine into the trachea. The interior of the trachea was then mopped with 5 per cent. cocaine as far as the bifurcation, coughing being thereby prevented. The anaesthetic was now changed to oxygen and chloroform, given through a Eustachian catheter directly into the trachea.

Irwin Moore's internal illuminating bronchoscope was then introduced into the right bronchus, where the curve of the hook attached to the vulcanite body of the toothplate was seen. By the aid of Irwin Moore's forceps the plate was seized and brought to the tracheotomy wound, where, unfortunately, it slipped from the forceps grip, and, before the assistant was able to secure it, was sucked back into the trachea and again lodged in the right bronchus. It was again seen, seized, and brought upwards, but once more slipped from the forceps grip (the vulcanite surface was rendered extremely difficult to hold owing to much mucus) while still in the trachea, and this time fell back into the left bronchus, where it was ultimately secured and brought out through the tracheotomy wound. The trachea and bronchi had previously to this been mopped with 20 per cent. cocaine as the frequent manipulations had rendered their surface irritable.

The plate when removed was found to contain the hook end, a portion of which was missing, and five tooth sockets holding three teeth, two being empty, and the plate had evidently been broken exactly in the middle line. In order to be quite sure that nothing was left behind the bronchial tree was explored on both sides with the bronchoscope, a good view being obtained. The patient subsequently passed the other half of the plate with five teeth in five sockets per rectum, having evidently smashed the plate in half while in an epileptic spasm, and broken off two teeth as well—these latter were not recovered. After-progress was uneventful save for some mild bronchitis, for which due precautions were taken.

Noteworthy points about the case are:

(*a*) It would seem that, in similar cases where large and slippery foreign bodies are present in the bronchi, the position of the patient should be oblique with head slanting downwards in case of slipping of the forceps grip.

(*b*) The assistant should be ready with a pair of Spencer Wells forceps to secure a good grip on the foreign body whenever it appears in the wound.

(*c*) Tracheotomy would seem advisable in this class of case, as the foreign body was too large to be drawn through the bronchoscope, and had to be brought up together with the withdrawal of the tube, and would otherwise have certainly damaged the glottis.

(*d*) Anaesthesia as carried out in this case, by means of chloroform and oxygen administered through a large-size Eustachian catheter introduced alongside the bronchoscope, proved very satisfactory.

CASE II.—*Foreign Body in the Hypopharynx just Above the Entrance to the Oesophagus.*

M. K., a schoolgirl 9 years of age, was admitted to the Portsmouth Eye and Ear Hospital on September 18th, 1922, with a history of having swallowed a drawing-pin while at school. A radiograph showed the drawing-pin lying slightly to the right of the middle line opposite the ring of the cricoid cartilage.

The patient was anaesthetized with C.E. mixture and an oesophagoscope introduced. At first the foreign body was not seen, the oesophagus being entered and found normal in appearance; but on withdrawing and examining the right lateral wall of the hypopharynx it was easily observed and removed with forceps.

The value of endoscopic methods was well illustrated in this case as any blind manipulation with coin catchers, etc., could only have been productive of injury owing to the sharp point of the drawing-pin, and the danger of pushing it downwards with a probang or other means is obvious. External incision would have necessitated a severe operation and probably a tedious convalescence.

CASE III.—*Mass of Fish Bones Impacted Across the Oesophagus Opposite the Sterno-clavicular Articulation.*

Mrs. A. J. was seen by me in consultation with Dr. Lyth of Southsea in the spring of 1921, with a history of having swallowed a mass of fish bones whilst eating a meal, and that this was followed by great pain radiating over the lower neck and clavicular region on both sides, and inability to swallow.

The patient was anaesthetized and the oesophagoscope introduced, when the fish bone mass was seen lying transversely across the oesophagus opposite the site of pain—that is, the inter-clavicular region. The mass was seized with forceps and easily came away, affording complete relief.

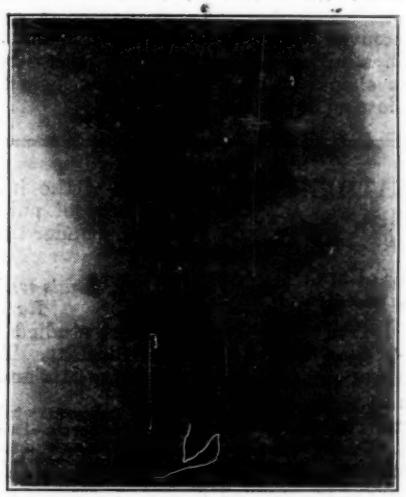


FIG. 2.—Case ii: Drawing-pin in hypopharynx.

This case, again, shows the advantages of endoscopic methods as opposed to the more barbarous probang which in olden days alone would have been available; a mass of bone thus situated could easily wound the walls of the oesophagus, and in such a position suppuration or damage to large vessels in the vicinity might easily prove fatal.

CASE IV.—*Toothplate Impacted in the Oesophagus; Failure to Remove it owing to Lack of Necessary Appliances.*

A. B., a female patient aged about 35, was admitted to the Royal Portsmouth Hospital in September, 1921, with a history of having swallowed a metal toothplate with pointed lateral extremities but no hooks. A radiograph confirmed the history, and showed the plate lying horizontally across the oesophagus just below the ring of the cricoid.

Under local anaesthesia an oesophagoscope was introduced and the upper edge of the plate easily located; the plate was seized with forceps, but could not be shifted owing to the fixity of its pointed lateral extremities in the walls of the oesophagus.

As I was not then in possession of Irwin Moore's shears for dividing such plates in the middle line and removing them in two halves, freeing their points of attachment in this way, and also not then having Paterson's recent expanding oesophagoscope, I was unable to continue endoscopic methods and had to have recourse of necessity to external oesophagotomy. This I performed through a somewhat unusual route. As I knew exactly the location of the toothplate, I incised the middle line of the neck, divided the isthmus of the thyroid, and retracted the left lobe of the thyroid away from the trachea and opened the antero-lateral

aspect of the oesophagus. Having removed the foreign body, I closed the oesophageal wound and allowed the left lobe of the thyroid to fall back, placing a small drainage tube down to the oesophageal incision, and otherwise closed the skin wound. A temporary oesophageal fistula supervened, but healed within a fortnight; otherwise after-progress was uneventful.

The failure to remove the foreign body in this case by endoscopic methods was entirely due to lack of the necessary implements. External oesophagostomy in the face of modern appliances must now be regarded as unnecessary, if not almost bad surgery, when applied to foreign bodies of a non-penetrating variety; and when one contrasts the rapid recovery with the minimum of inconvenience to the patient of endoscopic methods, as compared with the more serious character of and prolonged convalescence from external surgical procedures on the oesophagus, the latter should be considered by all surgeons as out of date, unless the circumstances are very exceptional; such methods as blindly groping with probangs, etc., should only be mentioned to be condemned.

CASE V.—*Meccano Wheel Impacted in the Oesophagus Opposite the Third Dorsal Vertebra.*

The patient, a boy aged 6½, was admitted to the Portsmouth Eye and Ear Hospital on December 5th, 1922, with a history of having swallowed a meccano wheel, through which he was trying to whistle. The radiograph (Fig. 3) shows its position as stated above.

FIG. 3.—Case v: Meccano wheel in oesophagus.

This is the type of case where up to recent years (and even possibly nowadays) a probang would be used to push the foreign body downwards, to be passed per rectum, with probably no great inconvenience to the patient; but the ease with which it can be seen and removed by endoscopic methods, as was done in this case, with the elimination of any possible subsequent complications or damage to the oesophageal walls, still further renders the use of such instruments as the probang inadvisable when other methods are available. As regards the technique to be observed in endoscopic manœuvres such as the foregoing cases entailed, the conclusions arrived at from these and other cases are as follows:

1. *Position of the Patient.*—If the manœuvre is to be carried out under a local anaesthetic, which is only possible in a certain proportion of cases, the patient should sit on a low stool, with the head in the "sword-swallowing" position—that is, extended fully, chin pointing upwards; if under a general anaesthetic, the patient should lie in the dorsal position, head over the end of the table, supported so as to bring the chin as nearly as possible level with the prominence of the thyroid cartilage. The patient as a whole should be on an inclined plane, head lowest, so as to obviate the occurrence which happened in Case I, of the foreign body slipping back if escaping from the grip of the forceps.

2. Before operation, in the case of adults a hypodermic injection of 1/150 grain of atropine should be given fifteen minutes before commencing, and in the case of children under 12 years of age 5 to 10 drops of tincture of belladonna, according to the age of the child, by the mouth. This will be found very useful in preventing undue accumulations of mucus. In nervous adults also 1/6 to 1/4 grain of morphine hypodermically will assist by calming the patient.

3. *Choice of Anaesthetic.*—As it is of great importance that the field of vision be unimpeded by collections of mucus, C.E. mixture, followed by pure chloroform, has been found of greatest service. In the case of adults, whose control is good, a local anaesthetic may be used with advantage; it will, however, take from ten to fifteen minutes to prepare the fauces and pharynx by painting with from 5 to 10 per cent. cocaine before complete tolerance is obtained, and a stimulant such as sal volatile should be at hand in case of fainting or collapse. Some distinguished endoscopists claim to use little or no local anaesthetic and to be able to induce their patients to allow them to pass their instruments. One regrets that one's own experience differs from this.

4. *Position of Surgeon.*—If the patient is under a local anaesthetic, the surgeon stands while the patient sits on a low stool. If the patient is under a general anaesthetic, the surgeon sits on a low stool—a dressing-box makes an admirable seat.

5. *Treatment of Tubes.*—The tube should be warmed and smeared with glycerin as a lubricant; a cold tube excites spasm.

6. Lastly—a small but practical point—if the surgeon is wearing glasses himself, these should be well warmed or smeared with Sterilla soap, otherwise he is liable to find his own vision fogged just when he most particularly wishes to see clearly.

"LUNG SPLINTING" IN THE TREATMENT OF PULMONARY TUBERCULOSIS.*

BY

SAMUEL HENRY STEWART, M.D.EDIN.,

MEDICAL SUPERINTENDENT, BELFAST MUNICIPAL SANATORIUM, WHITEABBEY.

THIS paper represents an attempt to work from evidence ascertainable by the clinician towards treatment in pulmonary tuberculosis. Practically any organ in the body may be attacked by tubercle; the frequency and course of the pulmonary lesion then raises the question of the significance of this particular condition. Fuller appreciation of Koch's experiments, which demonstrated the behaviour of immunized cells to tuberculous infection, forces the attitude that pulmonary tubercle is a phase in tuberculosis having defensive properties, and probably supplementing the lymphatic system in guarding against spread to other parts. This defensive element must receive consideration in treatment. The majority of serious therapeutic attempts have at their foundation the production of immunity. This phase of tuberculosis is ill defined and the results would appear to justify experiment in supplementary or other directions.

Taking these facts into consideration I studied, on a comparative basis, various manifestations of tuberculosis. The following observations would seem to establish *rest of the diseased organ* as a fundamental in treatment. The discussion of the introduction of rest by lung splinting in the treatment of pulmonary tuberculosis can be dealt with most logically under three headings.

* Abstract of a communication to the Ulster Medical Society.

I. *Facts which Point to Immobilization as being a Rational Procedure in Treatment.*

I first studied the deaths incident to the various tuberculous lesions. The following list,[1] representing the deaths in a large Midland city, is cited as a basis of argument:

Pulmonary tuberculosis	1,171
Tubercle of abdomen	55
Tubercle of spinal column and joints	34
Tuberculous meningitis	74
Disseminated tuberculosis	40
Tubercle of glands and other parts	11

In the above table we notice that mortality from tuberculosis is mainly associated with organs whose function involves movement. Tubercle in what may be described as stationary organs accounts for a comparatively small number of deaths.

I next considered this association of tuberculosis and mobile organs clinically. To this end I divided up the various common lesions for comparison as follows: (*a*) Disease in the stationary organs—for example, glands; (*b*) disease in organs which are mobile but capable of being immobilized—for example, joints; (*c*) disease in mobile organs which are uncontrolled—for example, lungs. The large majority of cases falls into the third category.

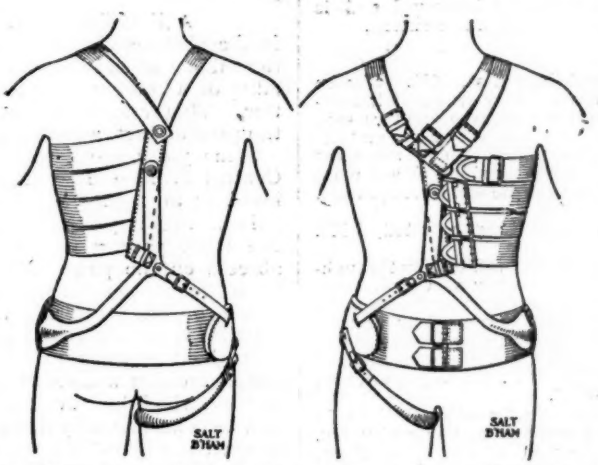
Study of these three chronic types of tuberculosis soon

reveals the fact that natural or mechanical immobilization is not associated with anything like the systemic toxaemia or the incidence of metastases that are so common in cases of pulmonary disease. Those who have been associated with considerable numbers of patients suffering from progressive pulmonary tuberculosis and, say, osseous lesions, must have noticed that Nature can exert healing properties in the latter conditions when resting, while the pulmonary disease is slowly increasing. That this is due to secondary infections in the lung is improbable since the manifestations are those of tuberculous infections. Or again, it may be necessary to make allowance for tissue susceptibility, but, comparing one tuberculous joint immobilized with another free, there is little difficulty in deciding that movement is trauma—when it is in a joint. The fact I want to emphasize is that the introduction of movement produces a baneful influence.

As a corollary to this reasoning, if movement be a factor responsible for the progressive toxaemia and the spread of the disease to other parts of the body, then immobilization should unquestionably produce beneficial results. As far as toxaemia is concerned we have proof of the beneficial effect of low-tension artificial pneumothorax.[2] With regard to metastasis, trustworthy evidence of spread of disease from a lung whose respiratory excursion is restrained is not available.

There are probably several factors which determine the incidence of tuberculosis, but once disease is established movement would doubtless be of importance in causing extension to other parts of the lung or body, and, on the analogy of the tuberculous joint, would retard healing.

Again, let me remind the reader that one of the earliest manifestations of tuberculous disease in a joint is muscular rigidity—that is, Nature attempting to splint and produce rest. This same effort at restraint by Nature is also found in pulmonary disease, though less manifest. The reduced movement occurring over a diseased lung indicates the possibility of lung splinting, despite the bilateral character of respiratory movement.



Left lung splint. Total weight = 2½-3 lb. A small elbow-lever on hip pad prevents perineal strap chafing right thigh. Fulcrum of supporting lever about point where spinal movements independent of pelvis cease.

With regard to the question of auto-intoxication, I think we may assume, considering the effect of immobilization, that the chief factor involved in the dissemination of tuberculous toxins is the respiratory disturbance of the diseased lung.

Consideration of these facts would suggest that treatment should have as its object the promotion of healing of the lung lesion and also the prevention of metastases and toxaemia. With this end in view it is absolutely necessary to produce a resting condition not only of the lesion, but also of the adjacent healthy, or comparatively healthy, lung tissue.

II. *Immobilization by Means of an External Splint.*

If the introductory reasoning be regarded as sound, it is necessary to develop a means of immobilization which is capable of a comparatively wide application. From time to time attempts have been made to restrain or prevent lung action with therapeutic intention. The most outstanding instance is that of artificial pneumothorax. Other methods of restraining lung activity have been employed, such as mechanical restraint by means of adhesive strapping or by a belt, introduced by Denison[3] and Sewall[4] respectively. Webb[5] introduced rest of individual lung by posture. More recently Knopf[6] has suggested a method of pronounced diaphragmatic breathing by means of which respirations may be reduced to 5 to 10 a minute. All of these workers were convinced of the beneficial effects following lessened activity.

Working on the lines indicated I set about inventing a device which would take cognizance, at least to some extent, of the three factors in respiration—namely, rib movement, diaphragmatic movement, and lung movement. The device I have called a lung splint. Its character will be evident from a study of the accompanying illustration.

All parts were suitably padded and made so light and comfortable that it was possible to wear the splint continuously. A light woollen garment was preferably worn next the skin. The patient expired completely and the straps were just comfortably tightened on the chest wall in this position, a small pad being used above and below the clavicle. The degree of immobilization was gradually increased, so that the patient became inured without any real discomfort. Notable features of this appliance are that the limbs have free movement; there is no vital impairment of the opposite lung; a certain amount of lateral spinal movement is possible, a striking feature being that leaning to either side increases the tension of the restraining belts. This apparatus was perfected by Messrs. Salt and Son, Ltd., 5 and 6, Cherry Street, Birmingham, and is manufactured by this firm.

III. *Effects of Lung Splinting.*

The fact that tuberculous lesions in one part can exert healing properties while those in other parts are progressing unfavourably, would suggest that healing in tuberculosis is primarily a local effort. The effects, then, of a procedure which recognizes the importance of the local condition demand consideration. I shall indicate briefly how it appears to me restriction by means of this splint is effected.

By relaxation of the costo-sternal portion of the diaphragm contraction of the crus does not bring about the piston action which results in the lowering of the diaphragm. With regard to the ribs, these are intimately associated in producing enlargement of the thoracic cavity. Enlargement in turn causes expansion in all parts of the lung capable of functioning. Tendeloo's law is not now accepted, as Keith has shown that lowering of the diaphragm produces an effect even at the apex of the lung. No doubt the degree of expansion in different areas has some relation to the adjacent portion of the expanding mechanism. It is quite evident, therefore, that fixation of the ribs in the position of expiration together with impairment of diaphragmatic function will effect very considerable diminution of lung movement. Splinting takes these facts into consideration and, what is equally important, recognizes the fact that rest which does not extend to the healthier part of the lung defeats its own object.

The first effect of lung splinting that has to be recorded is that it is possible to restrain lung activity. Respiratory function seems to fall mainly on the lower two-thirds of the free lung. The reader is referred to the spirometric readings shown for each of the cases reported below. This opens up an interesting field of research in that the relative functioning of the lungs can be investigated.

Since my object in this preliminary investigation was not so much to publish results as to determine effects of splinting, I chose four afebrile patients who had been resident over periods as indicated below, and whose response to routine sanatorium treatment had been unsatisfactory or had been outlived. In this way contributory factors were eliminated as far as possible.

CASE I.

J. J., male, aged 18; admitted January 14th, 1921. He was chosen because he was a case of pulmonary tuberculosis for whom apparently nothing could be done. His condition was getting worse. Right lung splinted March 13th, 1922.

Spirometric Readings: Free, 3,760. Right lung splinted, 3,500. Left lung splinted, 3,380.

Condition Before Splinting.—Right lung infiltrated with crepitations throughout. Crepitations in left lung, with slight infiltration of upper third. There was morning and evening cough. Sputum (twenty-four hours): 1 ounce; numerous tubercle bacilli. There was frequent pleuritic pain. Haemoptysis: Clots four months previously. Musculature poor; marked languor, and poor capacity for work; variable appetite; frequent night-sweats; marked dyspnoea. Blood pressure, 114/70.

Condition After Wearing Splint Seven Months.—A few crepitations in right lung, above clavicle and at lower apex. No moisture in left lung. No cough, sputum, tubercle bacilli, or pleuritic pain. Haemoptysis: Staining during influenza four months ago. The musculature was greatly improved; he felt fit for work; his appetite was good; there were no night-sweats, and the dyspnoea had greatly improved. Blood pressure, 128/80.

This patient has made phenomenal progress. The improvement in the left lung has probably something to do with the limitation of antero-posterior thoracic enlargement.

CASE II.

T. W., male, aged 34; admitted July 19th, 1921. Chosen because he was a case of chronic bronchitis with clinical pulmonary tuberculosis. I thought sputum might be retained where the bronchial tubes were inflamed if immobilization were attempted. The condition was getting worse. He was particularly unsatisfactory at the time of splinting as he had just suffered from a sharp attack of influenza. Left lung splinted March 13th, 1922.

Spirometric Readings: Free, 3,006. Left lung splinted, 2,900. Right lung splinted, 2,470.

Condition Before Splinting.—Crepitations in left lung to sixth rib anteriorly and angle of scapula posteriorly. Rhonchi through chest. Cough troublesome in the morning. Sputum (twenty-four hours): 1 ounce; no tubercle bacilli. The musculature was good; there was marked languor, and poor capacity for work; appetite good; occasional night-sweats; marked dyspnoea on exertion. Blood pressure, 122/70.

Condition After Wearing Splint Seven Months.—Crepitations apex to second rib and in suprascapular region. Rhonchi throughout chest. No cough. Sputum, half an ounce; no tubercle bacilli. Languor gone, and capacity for work greatly improved; appetite good; no night-sweats; marked dyspnoea on exertion. Blood pressure, 124/80.

This patient claims that he feels greatly improved and is anxious to go out to work. No evidence of sputum retention.

CASE III.

W. G. C., male, aged 19; admitted May 31st, 1921. Chosen because he was an advanced case having very frequent haemoptysis. The left lung was the more actively diseased, and I guessed the blood had its origin in this lung. He was very weak and the outlook was unfavourable. In addition infiltration in the right lung extended below the third rib. I was anxious to see what effect would be produced in the right lung if the left were splinted. Left lung splinted March 13th, 1922.

Spirometric Readings: Free, 2,220. Left lung splinted, 1,900. Right lung splinted, 1,756.

Condition Before Splinting.—Crepitations and infiltration throughout left lung; cavitation at inferior angle of scapula. Crepitations over upper half of right lung; less marked infiltration throughout. Cough severe in early morning. Sputum (twenty-four hours): 1½ to 2 ounces; numerous tubercle bacilli. Frequent haemoptysis; sometimes twice in same week. Musculature poor; marked languor; felt unfit for work; appetite fair; no night-sweats; marked dyspnoea. Blood pressure, 104/58.

Condition After Wearing Splint Seven Months.—Crepitations in upper half of left lung; evidence of fibrosis going on; cavity dry. Disease more active in right lung. Very slight cough. Sputum, 1½ ounces; few tubercle bacilli (both sputum and bacilli less at end of June). Free from haemoptysis up to July 10th; faint streaks occasionally since. Musculature improved; feels well; capacity for work improved; as also had appetite to end of June; dyspnoea not so marked. Blood pressure, 115/70.

This patient claims that he is much improved since the splint was applied. Note cessation of haemoptysis. There is no doubt he made considerable progress up to the end of June. I noted then that the right lung was not so satisfactory. Sputum, etc., increased slightly. I am doubtful with regard to the ultimate result, though the feeling of well-being remains.

CASE IV.

E. M., female, aged 28; admitted August 12th, 1921. Chosen because she was a well marked case of pulmonary tuberculosis showing evidence of failing resistance, also because she was physically frail. Left lung splinted May 1st, 1922.

Spirometric Readings.—Free, 2,030. Left lung splinted, 1,920. Right lung splinted, 1,640.

Condition Before Splinting.—Marked disease with crepitations throughout left lung. A few crepitations at apex of right lung. Severe cough, causing vomiting each morning. Sputum (twenty-four hours): 1 ounce; tubercle bacilli fairly numerous. Haemoptysis once, nine months previously. Musculature poor; marked languor; poor capacity for work; appetite fair; marked dyspnoea on exertion. Blood pressure, 105/60.

Condition After Wearing Splint Five Months.—Left lung: Post-tussic crepitations only above and below clavicle and in supra-scapular region. Right lung: No moisture. No cough. Sputum practically gone; no tubercle bacilli. Musculature good; fit for work; appetite good; dyspnoea greatly improved. Blood pressure, 110/72.

There is no doubt about the improvement in this patient.

The question of blood pressure is interesting. One would expect a certain lowering as a result of impaired thoracic movement. Having regard to this, and also the possibility of patients in the circumstances manifesting a certain amount of excitement, I am bound to say that I think there is room for feeling that the increase in pressure, especially diastolic pressure, is evidence of lessened toxaemia.

My object, however, was mainly to record effects, and this I have done as faithfully as I can. Perhaps I should emphasize that my observations do not include a claim that complete immobilization of the diseased lung is established. My contention is that movement would seem to be restrained to a degree approaching what might be termed rest. Excision of a portion of the second rib as an adjunct is contemplated if necessary.

So far I am not sure that there are any contraindications to the use of this lung splint. Even in the very advanced Case III there is little doubt that the patient benefited. Apart from slight retraction of the side splinted no untoward effect noticed has escaped record.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A FEATHER IN THE PAROTID DUCT.

IN the abstract No. 168 of the *Epitome* of February 24th, on the subject of salivary calculi, reference is made to the possibility of a foreign body forming the nucleus of the concretion. This reminds me of an instance of a foreign body in the parotid duct, which is unique in my experience.

Some years ago a small child was referred to me at the Central London Throat and Ear Hospital on account of inability to open the mouth and the presence of a large painful swelling extending backwards and downwards from the right parotid region. The swelling was obviously an abscess on the point of bursting externally. I was able to force the mouth open sufficiently to allow me to see a small white object projecting from the orifice of Steno's duct. I pulled it out and found it to be the tip of a feather, which was about an inch in length. Evacuation of the pus by a simple incision was soon followed by complete recovery. The feather, which had evidently come out of the child's pillow, had been accidentally drawn into the mouth. The stem had entered the parotid duct, and the feather had apparently worked its way inwards in the same fashion as a spike of grass when put inside the coat sleeve, in the familiar trick of our childhood.

London, W. JAMES DUNDAS-GRANT, K.B.E., M.D.

MENINGITIS DUE TO PFEIFFER'S BACILLUS.

MENINGITIS associated with the presence of Pfeiffer's bacillus in the cerebro-spinal fluid is still sufficiently uncommon to deserve record. In the following case, as the cerebro-spinal fluid eventually became normal, it would appear that recovery ensued from the meningitis, the patient dying from pulmonary complications.

S. G., aged 62, had been operated upon twenty years previously for bilateral empyema of the antrum of Highmore; the sinuses were kept open by gold fillings in tooth sockets, and the patient continued to irrigate the antra daily. For the past five years he had suffered from recurrent attacks of nasal catarrh at very frequent intervals. The nose was examined, polypi diagnosed, and operation advised. At the time of removing the nasal polypi pulsation through what appeared to be a small deficiency in the cribriform plate of the ethmoid was noted.

Rigors occurred within a very short time of the operation, and three days later, the temperature having risen to 101.8° F., with pulse rate of 90, the patient began to complain of intense backache and frontal headache. His mental condition was normal, pupils small but active to light and accommodation, optic discs and other cranial nerves normal. The remaining physical signs were as follows: general cutaneous hyperaesthesia, slight rigidity of cervical muscles, no apparent spinal rigidity, Kernig's sign positive, knee and ankle jerks sluggish, abdominal reflexes sluggish and equal, plantar reflexes flexor with active withdrawal of the leg; heart and lungs normal. On lumbar puncture a turbid yellowish fluid under slightly increased pressure was obtained; when microscopically examined numerous polymorphonuclear cells and a few mononuclears were seen, but no organisms. On culture, Dr. Clement Lovell reported the presence of an organism showing the following characteristics: "A short Gram-negative bacillus growing only on blood agar or agar smeared with blood. Subcultures are more vigorous. No fermentation with glucose, maltose, or saccharose; a slight deposit in broth. The organism is non-pathogenic to the guinea-pig (Pfeiffer's bacillus)."

During the following week occasional delirium and retention of urine occurred, but the physical signs remained practically unaltered. Two doses of Pfeiffer's bacillus vaccine were administered, 5 and 10 million organisms respectively, the second dose being

given four days after the first. Lumbar puncture was performed and the intrathecal sac drained every other day, each successive sample of cerebro-spinal fluid withdrawn being less turbid than the preceding one.

After the first week the patient developed pulmonary complications and increasing drowsiness. The cerebro-spinal fluid, however, continued to become clearer to the naked eye and to show a decreased cell content; finally, fifteen days after the onset of meningitis, a perfectly normal sample was withdrawn. The general condition of the patient became worse, and he died on the twenty-first day of illness, apparently from bronchopneumonia. An autopsy was not permitted.

CECIL WORSTER-DROUGHT, M.D.
S. W. QUARTLEY, L.M.S.S.A.

London, W.

ISOLATION OF B. ANTHRACIS FROM A SHAVING BRUSH.

FIVE years ago a malignant pustule developed on the cheek of a male after a few days' shooting in the veldt. The lesion appeared to develop on the site of an insect bite, and the condition was successfully treated in the Municipal Hospital, Bulawayo.

There has been anthrax in S. Rhodesia, but not of recent years, and infection might have resulted from camping on an old cattle kraal, or from the use of an infected shaving brush. The one which was in use had been purchased shortly before, and had been imported from Japan. The shaving brush was submitted to me in February of this year, and by placing the bristles in broth and incubating for forty-eight hours colonies were obtained on subculture which had the appearance of *B. anthracis*. Morphologically, too, the micro-organism resembled *B. anthracis*. A pure culture was obtained and a small quantity injected into two mice, both of which died within thirty-six hours. In both instances the spleen was much enlarged and diffluent, and the bacillus was recovered.

The interest in this case lies in the length of time elapsing between the infection and the isolation of *B. anthracis* from the shaving brush, and illustrated the fact that an infected shaving brush is of potential danger for a very long time.

A. NEAVE KINGSBURY, M.B., B.S.,
The Bland-Sutton Institute of Pathology, B.Sc., D.P.H.
The Middlesex Hospital.

Reports of Societies.

TREATMENT OF CANCER OF THE TONGUE.

AT the Medical Society of London on February 26th Mr. JAMES BERRY gave an address, preliminary to a discussion, on the treatment of cancer of the tongue. Lord DAWSON OF PENN presided.

Opening Paper.

Mr. BERRY commented upon the extraordinary differences of opinion as regards the details of operative treatment, and on the misleading character of many published statistics. The number of operations he had performed for the removal of the tongue in malignant disease—about forty altogether—was rather small, but he had at one time considerable opportunities of studying the pathology and clinical course of such cancers. He realized early that the ordinary mode of extension of carcinoma of the tongue was in a downward and backward direction towards the hyoid bone. Operations for the removal of primary growth should always extend widely in these two directions. He insisted on the necessity for free removal of the growth. Opinion was unanimous on the importance of early diagnosis and treatment. The public must be educated as to the importance of showing to a doctor any ulcer or growth that appeared on the tongue, and general practitioners must be impressed with the importance of not wasting time by attempting to treat suspicious growths by caustics or mouth-washes or other harmful or inefficacious remedies. Diagnosis presented little difficulty. Any doubtful ulcer should be excised and examined microscopically, and if found malignant treated forthwith by the larger operation, not by cauterization of any kind. He believed that he operated somewhat more willingly and freely in advanced cases of cancer than many surgeons; it was not that he operated with much expectation of permanent cure, but if the whole of the primary disease could be completely eradicated an extensive operation did afford to many patients who were in a miserable state of pain and distress a good prospect of speedy recovery for the time and immunity from suffering for some months.

He favoured the external or submaxillary operation, rather than the intraoral; to split the cheek to obtain better access to the posterior part of the tongue was an unnecessary mutilation, and to saw through the symphysis of the jaw seemed too severe, except perhaps for certain rare cases in which the body of the jaw was actually involved in the growth. He objected to the term "Kocher's operation," because the use of proper names for any operation was inadvisable, and because there were two distinct operations, both of which were known in the textbooks as Kocher's. The operation described as Kocher's submaxillary operation was widely different from the submaxillary operation which the speaker and other surgeons did at the present day, and he did not doubt that Kocher in his later days did not do anything like the textbook description.

Carcinoma of the tongue was essentially a local disease, with scarcely any tendency to affect distant organs. It tended, however, to infect at the earliest stage the nearest lymphatic glands, and if the growth originated in the anterior part of the tongue the removal of the glands *en bloc* could and ought to be performed when there was reason to fear such infection. If, however, the growth originated in the posterior part, the deeper cervical glands were those likely to be affected, and as they could not be removed *en bloc* a permanent cure was scarcely to be expected unless the primary growth was excised at a very early stage indeed. He had grave doubts whether so-called block dissection at one or both sides of the neck, which was very popular in certain quarters, was ever worth doing. It was not really a block dissection at all, but the picking out of certain lymphatic glands and ducts from among other structures which could not be removed. The procedure in early cases and cases situated in the anterior part of the tongue was seldom necessary, and in advanced cases, especially at the back of the tongue, was generally useless. He was by no means convinced that an unsuccessful attempt to dissect out the affected glands in the lower part of the neck did not often favour the spread of the disease.

Mr. Berry then proceeded to give a list of 27 operations he had done in hospital during thirty years, all of them submaxillary, nearly always very extensive, and mostly involving the removal of one-half or the whole of the tongue, right back to the hyoid bone. He had had very few opportunities of treating early cases. He gave a detailed account of the large operation he had practised in these cases, his submaxillary operation differing in certain points of technique from that ordinarily done. He accompanied his description by photographs of the different stages of the operation done on a dead body. It was important that the mucous membrane should not be cut nor the mouth opened until all the muscles in the anterior and median portion of the tongue had been freely divided. A sponge must be put into the angle of the pharynx and the tongue to prevent what little blood there was trickling down into the pharynx. He indicated various other points and precautions. After the operation the patient should be got up betimes and made to wash his mouth out thoroughly. He usually told his patients that they had nothing else to do but to wash out their mouths, and for this purpose lotion and tumbler were by the bedside. He did not practise diathermy, and he did not wish to speak against it; but diathermy necessarily left the wound covered with a slough. It was of no use saying that it was a dry slough. It was dry at first, but within a week of the operation he could not understand how a slough of that kind could be other than septic.

Discussion.

Mr. CLAYTON-GREENE upheld the use of diathermy, which enabled him by an intraoral method to destroy the tongue right back to the epiglottis; diathermy also eliminated any possible chance of cancerous dissemination in the wound. By the time the slough became septic the lymphatic spaces of the neck were shut off by their natural protection. Mr. HAYWARD PINCH spoke of the value of radium, though he admitted that absolute cures were extremely few, if they occurred at all. He instanced three cases of continuing good results from the insertion of small powerful emanation tubes. Mr. GORDON TAYLOR said that he performed the much decried block dissection of the neck, the extirpation of the tongue itself being carried out at a subsequent operation. Where there was any extension of the growth to the floor of the mouth he did not hesitate to split the jaw and wire the bone again at the end of the operation.

Mr. A. EDMUNDS said that he had recently, to his disappointment, to do a second operation on his most successful

case, which had gone on so long—fourteen years—after the removal of half the tongue that the patient's friends were saying that it could not have been cancer at all. The man had returned with growth on the tip of the tongue, unquestionably malignant, but, fortunately, still removable.

Mr. H. S. CLOGG said that he had given up the so-called block dissection; he divided across the sterno-mastoid, and made a direct attack upon that region of the neck which lay round about the mastoid and the belly of the digastric muscle, and if any glands were enlarged he had no hesitation in excising. Mr. CECIL ROWNTREE had found results disappointing; it did not seem to make much difference what kind of operation was done. This was the most hopeless kind of cancer, and apparently only palliative measures could be attempted. Mr. W. G. SPENCER pleaded that the general practitioner should take more seriously any lesions in the mouth. Dr. LAPTHORN SMITH was convinced that the new attention to dental hygiene would make cancer of the tongue an extremely rare condition in the future.

Mr. BERRY, in replying, remarked that little had been said about results, and he suspected they were extremely bad. He knew of only two cases which had survived more than five years. His most successful case was that of a medical student who had a small epithelioma on the side of the tongue which he had only noticed for six weeks. Half the tongue was removed, and, two months later, the glands in the submaxillary; the patient had no return whatever, but, five and a half years later, died of epithelioma of the lower end of the oesophagus.

DIABETES INSIPIDUS.

A MEETING of the Medical Section of the Royal Academy of Medicine in Ireland was held on February 16th, with Dr. O'CARROLL (in the absence of the President, Dr. T. G. Moorhead) in the chair. Dr. F. C. PURSER showed a middle-aged man who had been suffering from diabetes insipidus for about four years. The smallest quantity of urine passed in twenty-four hours was 480 oz.; the average was 520 oz.; on an average 34 oz. were passed at a time. The patient was feeble and thin, and much bothered with frequent micturition, but no evidence of disease of any sort other than the diabetes could be elicited. Professor Scott had demonstrated inosit in the urine. Thyroid extract had been administered without any result, and pituitrin had been tried for several days hypodermically without any appreciable effect. Cerebro-spinal fluid, to the amount of 7 c.cm., was withdrawn after the failure of the pituitrin: the fluid was perfectly normal, its Wassermann reaction was negative, and the pressure was not excessive. The patient suffered no unpleasant symptoms afterwards, but the quantity of urine passed rose to a very constant 640 oz. in the twenty-four hours. Dr. CROFTON thought that if thyroid extract was given in bigger doses, in severe cases such as this it might prove beneficial. Dr. G. E. NESBITT said that the results obtained by pituitary extract in many of these cases seemed very striking; he was of opinion that specimens on the market must be often inert, and they were apt to forget this in case of failure. He suggested that Dr. Purser should try a different brand of pituitary extract in the case. Dr. O'CARROLL and Dr. KIRKPATRICK also discussed the case.

Dr. J. O'DONNELL showed a patient aged 70, who, while under treatment for chronic nephritis, developed herpes zoster associated with considerable pain in the distribution of the fifth to the eighth cervical areas on the left side. This was followed in the course of a few days by atrophy of the muscle of the shoulder girdle. Subsequently there was some herpes in the region of the distribution of the seventh cervical area on the right side, but this was not followed by muscular atrophy. The condition of the patient was improving slowly. Sir JOHN MOORE said that he thought there was not much doubt regarding the diagnosis of the case, as it seemed to him to be almost certainly a case of anterior and posterior myelitis. Dr. F. C. PURSER said that he had treated a somewhat similar case, who died about two years afterwards from myelitis.

Dr. H. F. MOORE read a paper entitled "Insulin and diabetes—the present position." He made a comprehensive survey of the literature to date; the ideas conceived in 1920 by Banting were explained, and the work carried out by Banting, Best, Collip, and others in Macleod's laboratory in Toronto on the preparation and study of active pancreatic extracts was described. The various stages in the experimental work on the improvement of the methods of preparation of the extract and the possibilities for the future in this direction were discussed. The physiological actions of insulin on the lowering of blood sugar, abolition of acidosis and glycosuria, and the raising of the respiratory quotient were discussed, as well as its use and possible abuses in the treatment of diabetes mellitus. The importance of dietetic treatment in conjunction with insulin was emphasized. Some experiences of the author with cases of diabetes treated with insulin were mentioned.

The paper was discussed by Dr. O'CARROLL, Dr. CROFTON, and Dr. G. E. NESBITT.

DEEP X-RAY THERAPY IN GYNAECOLOGY.

A MEETING of the Obstetrical Section of the Royal Academy of Medicine in Ireland was held on February 23rd, with the President, Dr. BETHEL SOLOMONS, in the chair.

Dr. G. E. PEPPER read a paper on deep *x*-ray therapy as used in the Schauta Klinik, Vienna. He described the "symmetrie" apparatus devised by Professors Seitz and Wintz of Erlangen, the essential points being the division of the coil into two symmetrical parts, and the inclusion in the circuit of two water-resistance tubes, with an enclosed point and plate spark-gap so as to destroy all oscillations and inverse currents and to prevent formation of poisonous gases. The various instruments used for measuring the dosage and the method of estimating the penetration of the rays by means of the water phantom were described, emphasis being laid on the great difficulty and importance of these preliminary calculations. The dosage table formulated by Seitz and Wintz was quoted, and the method explained by which a carcinoma dose could be given to a tumour 10 cm. deep, by irradiating over six different fields of the abdomen. The importance of accurately centring the tube in each field was pointed out. The susceptibility of different patients to radiation was referred to, and the great necessity of making a blood count before each treatment, owing to the destructive action of *x* rays on leucocytes and red corpuscles. The Vienna method of treating carcinoma of the uterus, with its advantages and disadvantages, and the application of *x* rays in cases of essential bleedings, amenorrhoea, menopause, and myomata were described. *X* rays were compared with radium in the treatment of malignant disease, and the combined use of both was advocated in order to obtain the best results. The action of *x* rays on malignant cells was said to be due to ionization, which caused lecithin to split up and liberate cholin, which poisoned and killed the cells. Cholin was set free in the very cells where its action was required, because malignant cells and tissues particularly sensitive to *x* rays, such as the testicles and ovaries, contained higher percentages of lecithin than other tissues.

Dr. W. C. STEVENSON said that a great deal of constitutional disturbance occurred when *x*-ray and radium treatment was being given—in his opinion as much as after an operation. It took a great deal out of a patient to get thorough treatment from *x* rays or radium, and it did not give him a proper chance if he only had one treatment; he should have at least two or three treatments. He thought if the growth was extensive there was a chance of increasing it by radiation, unless deep *x*-ray therapy was used; unless the dose in these cases lasted for eight hours he did not think it would do much good. A great number of patients in whom the cervix alone was involved were operated on, though in America as good results were obtained with radium alone, or combined with *x* rays, as by operation. Dr. L. L. CASSIDY said that his experience in hospital regarding radium had been rather unfortunate, as in two cases its application had appeared to stimulate the growth, although in another case of inoperable carcinoma the patient was very much improved.

Sir ANDREW HORNE said that the effect of *x* rays in stopping haemorrhage was undoubtedly wonderful. He had had one patient in whom, at the time the *x* rays were given, the condition was desperate, but the giving of *x*-ray treatment prolonged her life for a year, and made her feel much more comfortable. He agreed with Dr. Stevenson about the constitutional effects produced by *x* rays, as this patient suffered from a great deal of pain after treatment, which had to be relieved by the injection of morphine. Dr. G. TIERNEY said that, according to Erlangen technique, an eight-hour dose of *x* rays was not strictly correct; but on that matter

they might have different opinions in Vienna from Erlangen. In Erlangen Coolidge tubes were now used exclusively, and with them the unit skin dose was obtained in a little over twenty minutes. He was of opinion that in some cases constitutional reaction was severe, but he thought it was never anything so severe as it was after operation. Generally speaking, there was no difference between *x*-ray and radium treatment, and the indications for radium treatment were exactly similar to those for *x*-ray treatment; the contra-indications also were identical. The advantage radium had over *x* ray was that screening was much more effective. The constitutional symptoms were much more marked in *x* rays than in radium.

The PRESIDENT had read of collapse and anaemia following the Erlangen treatment, and he inquired if these were usually present, and also if prophylactic transfusion was often done. He believed that the *x* rays often stimulated potential cancer cells, and his feeling was that when a growth had been satisfactorily and entirely eradicated post-operative *x* rays were dangerous for this reason. He thought the treatment of fibroids by *x* rays was incorrect, unless in exceptional circumstances. There was no method of excluding malignant degeneration, and he had published several cases of inoperable malignancy following the *x*-ray treatment of fibroid. The difficulty in insisting on hospital patients returning for radium treatment in cancer of the cervix made the results of the treatment difficult to complete.

Dr. PEPPER, in reply, said that undoubtedly constitutional effects were produced after the application of *x* rays, but they did not last, and often the patients were able to return home in two or three days, whereas after operation they could not return for three or four weeks. Emanations were not used in Vienna, as they had such a considerable stock of radium; gas tubes were also used entirely, as they were much cheaper than Coolidge tubes.

Dr. R. E. TOTTENHAM exhibited a modification of the Rotunda siphon douche, which he stated was cheaper than the Rotunda siphon douche, and had the advantage that if any part of the rubber gave way it could be renewed without purchasing a whole new douche. Sir ANDREW HORNE showed two specimens, the first a malignant ovarian tumour, and the second a fibro-cystic tumour. Dr. GIBBON FITZGIBBON showed a specimen of a septic uterus. Dr. A. H. DAVIDSON read a paper on a case of traumatic subcutaneous emphysema complicating labour. Dr. L. L. CASSIDY read a paper on a rare case of maldevelopment of the female genital organs, and showed specimens.

"PINK DISEASE."

A MEETING of the Midland Medical Society was held in the Medical Institute, Birmingham, on February 14th, when the President, Dr. PURSLOW, took the chair, and some fifty-two members were present.

Dr. PARSONS showed a case of "pink disease" (erythredema). He gave a short summary of the literature of the disease, and stated that he had seen six cases. All had suffered from the condition for many weeks, but previous to the onset of the disease had been well nourished and healthy children. The outstanding symptoms in this series of cases were: (1) The presence of a rash varying in degree and character, but always accompanied by intense itching; (2) red, swollen, and cold feet and hands, showing desquamation; (3) striking mental changes, the patient often presenting a picture of the most intense misery; (4) gingivitis and stomatitis, with falling out of the teeth; (5) a varying degree of hypotonia and pseudo-paresis; (6) the frequent occurrence of respiratory disorders; (7) the liability to sudden death.

Dr. G. H. MELSON showed a man who had complained of severe pain in the left side for several months. This man had been seen by several surgeons and physicians, without a definite diagnosis being made. *X*-ray examination was negative. The pain was eventually found to be due to a loose costal cartilage on the ninth rib, which was removed, and a complete cure resulted. Dr. LEONARD PARSONS described a similar case following an accident, in which the fourth costal cartilage was separated from its rib, causing severe paroxysmal pain; this case recovered without operation.

Dr. O. KAUFFMANN exhibited the organs from a case of lymphadenoma. Blood films and microscopic sections from the same case were shown on the epidiascope. Dr. J. G. EMANUEL read a paper on the treatment of auricular fibrillation by quinidine sulphate.

Rebiews.

A HISTORY OF MILITARY MEDICINE.

THE remarkable series of *Notes on the History of Military Medicine*,[1] which appeared in the *Military Surgeon* between November, 1921, and August of last year, have been reprinted in a convenient pamphlet of 206 pages. They were originally intended for the information and instruction of medical officers of the United States army, and are an expansion of two lectures delivered by Lieut.-Colonel FIELDING H. GARRISON at the Field Medical School in Pennsylvania in June, 1921. The author has had at his disposal the matchless treasures of the Surgeon-General's Library at Washington, the Index Catalogue of which has now reached its fortieth volume and contains a list of some 600,000 books and pamphlets. Into this vast bibliography Colonel Garrison has dipped deeply, and his notes will be read with profound interest by all who are attracted by the fascinating study of the origin and results of wars throughout the ages; for he does not confine himself to describing the details and various stages in the practice of medicine, surgery, and hygiene in connexion with campaigns, but enlarges in clear language on the circumstances and psychologies which gave rise to and resulted from the conflicts of peoples from the earliest times to the present day. Although he has thus explored the literature of his subject widely and draws on historians, novelists, and poets for apt quotations and illustrations, his notes bear evidence of having been largely culled from the writings of Frölich, one of the surgeons-general of the Saxon army from 1896 to 1900, and a warm personal friend of Colonel Billings, formerly librarian of the Surgeon-General's Library. Frölich was the most prolific of all writers on the history of military medicine, and embodied most of his studies in his treatise *Militärmedicin* published in 1887. One of his most remarkable achievements was to make out a list of all the wounds mentioned in the *Iliad*, 147 in number, and classify them according to weapon, anatomical region, and total and percentage mortality. Incidentally it may be doubted whether Colonel Garrison is correct in the meaning given to the Homeric *ἰητρός* as an "extractor of arrows," as if derived from *ἰός*, an arrow. The more correct derivation is probably from *ἰάομαι*, to heal, and *ἰητρός*, or *ἰατρός*, thus means "healer."

Colonel Garrison devotes a chapter to the practice of medicine in prehistoric times, in ancient Egypt and Greece, and in the Assyro-Babylonian, Jewish, and Indian civilizations. It is followed by an account of the status of military medicine under the Roman Republic and Empire, the battle losses, the organization of the Roman army and the establishment of a medical service in it, Roman military hospitals and military sanitation. Passing to mediaeval times, Colonel Garrison gives England the credit of being the first to attempt an organized military medical service, at the time of the crusades. Efforts were also made to organize a public health service in the Middle Ages, when wandering soldiers and outlaws were spreading diseases of all kinds amongst the squalid and crowded populations of the walled towns. In these efforts "rulers, physicians, and public officials did their best work." Carriers of disease were isolated; they were prevented from entering the towns, and lazarettos were established. Another interesting record of this period is the organization of camp hospitals and an ambulance service by Queen Isabella of Spain during the wars with the Moors. The Queen herself visited the wounded in the field, and her chronicler, Dr. Withington, described her as the "*mater castrorum*."

The sixteenth century, or the period of the Renaissance, produced Ambroise Paré, whom Colonel Garrison regards as the greatest of military surgeons. It was a time when prostitution prevailed on a very extensive scale and syphilitic diseases were rife; it was followed by a period of continuous wars, devastating diseases, and starvation. A Polish knight, Abraham à Gehema, then arose to denounce the indifferent care of the sick and wounded soldier by "the half-baked medical personnel of the period." Colonel Garrison describes him as a "notable exhorter and hot gospeller of the soldiers' welfare."

In the eighteenth century military medicine became a definite function of governments. The outstanding figures of

[1] *Notes on the History of Military Medicine.* By Lieut.-Colonel Fielding H. Garrison, Medical Corps, United States Army. Washington: Association of Military Surgeons. (10 in. × 7¼ in., pp. 206. 1.50 dols.)

the period were Frederick the Great, Marlborough, and the Maréchal de Saxe, all of whom took an intense personal interest in the medical work of their armies. But Colonel Garrison omits to mention the influence of Joseph II of Austria, who of all other monarchs of his time was the most noteworthy in connexion with army medical organization. It was he who with the advice and assistance of his body surgeon, Brambilla, completely transformed the character and training of the army medical service and introduced a field medical organization, which Brambilla's successor, Sax, developed during the Napoleonic wars into that system of collection, evacuation, and distribution of wounded that was afterwards adopted by all the Continental armies and also by the British Army in more recent times. Yet Colonel Garrison makes no reference to these famous military surgeons or to the institution of the great military medical school in Vienna, the "Josephinum," founded by Brambilla in 1785; and he names as the greatest of military medical officers Baron Larrey, of Napoleon's day, and Letterman, the medical director of the Army of the Potomac in 1862. Most of us would regard Brambilla's and Sax's influence on army medical organization as greater than theirs.

Again, there is no mention of the famous Sir James Wylie (Baron Willy of Russia), who was the head of the Russian army medical services during the Napoleonic wars and founded the medical academies at St. Petersburg and Moscow in the reign of Alexander I, and who was a graduate, like his contemporary, Sir James McGrigor, of Aberdeen University.

In describing the wars of the nineteenth century Colonel Garrison gives a full and interesting account of the medical, surgical, and sanitary work of military medical officers and of the results of the epoch-making advances in scientific knowledge of disease during the century. The last chapter of his *Notes* is devoted to "the European war" of 1914–18. He introduces it with a dissertation on the philosophy of Nietzsche, which is described as "once a private luxury of antique despots and more recent artists and literary virtuosi," but became a dangerous dynamite in a society based on industrialism and inimical to the principle of "the greatest good of the greatest number" upon which modern medicine, sanitation, and social endeavour are based. A table is given of the battle losses during the great war in all nations, amounting to a total of killed, wounded, and missing of 34,299,314 out of a mobilized strength of 61,140,177. According to this table the Russian losses were greatest, exceeding nine million, the German next, nearly seven million, the Austrian over five million, the French over four million, the British three, and the Belgian just under three million. The United States lost 351,207 out of 4,175,367 mobilized. It is difficult to gauge the accuracy of these and other statistics given by Colonel Garrison, but they are no doubt supported by documentary evidence. Unfortunately he is not free from the common error of historians in misinterpreting or misunderstanding facts. For example, he describes Marlborough's famous march to the battlefield of Blenheim as one of 1,176 miles in 86 days. The march commenced on March 19th, 1704, and the battle was fought on August 13th. Colonel Garrison has evidently taken the 86 days covered by these dates as days of continuous marching and calculated the distance by multiplying the number of days by a daily march of 13 to 14 miles, whereas the celebrated march ended on June 27th at Gingen, within striking distance, 20 to 30 miles, of Schellenberg and Blenheim, and covered a distance of some 300 miles only in less than six weeks. Again, he quotes Sir John Goodwin as estimating the casualties among Regular and Territorial medical officers as 23,504 during the recent great war, of whom 3,181 were killed in action, 1,429 died of wounds, 1,887 of disease and other causes, and 17,007 were wounded, figures which Colonel Garrison says make an impressive showing. An impressive showing indeed, but happily untrue. Sir John Goodwin's figures refer to all ranks of the R.A.M.C., and not to officers only, of whom 743 were killed or died of wounds or disease. The statement that Great Britain was forced to adopt compulsory service on May 25th, 1915, is erroneous. There are several other errors regarding the British medical services. The British entry into Baghdad in March, 1917, is attributed to Allenby's invasion of Palestine. But this invasion did not take place till October of that year. Rutherford Morison, the inventor of bipp, is called Rutherford Brown. The meningitis incidence is stated to have been lowered by vaccination and "even dysenteries were rendered comparatively innocuous through preventive vaccination." This was certainly not the case in the British Army. There are also several statements which suggest some misunderstanding of the strategical and tactical employment of the medical services during the war. Such are his remarks regarding the origin of the casualty clearing station, which was due to the faulty reorganization of the field medical units after the South African war and not, as stated by him, to the organization of these units during that war; and his remarks to the effect that they were able to come closer to the front line during the final advance to victory and the onset of mobile warfare are due to misapprehension, for the contrary was the case. Barrage fire he seems to have regarded as a screen which enabled the stretcher-bearers to collect the wounded during daylight, as if this had not been done previously. On the whole, however, the interesting figures which he gives of the incidence of disease amongst the United States troops justify the remark that they show "the extraordinary advances made by preventive medicine in the twentieth century."

W. G. MACPHERSON.

PERICARDITIS.

THE monograph on acute pericarditis by Dr. GERMAIN BLECHMANN[2] will be of considerable interest to British readers. The subject is dealt with in a very comprehensive manner, and, though there are many references to the writings of many workers in France and other countries, the author takes a judicial attitude and expresses his opinion in a way which suggests careful thought and wide experience. Some of his statistical tables indicate the need for fuller knowledge and more accurate methods of diagnosis of this disorder. When out of 238 cases collected from four London hospitals only 40 per cent. were diagnosed during life, and of 100 cases of purulent pericarditis in children under 12 years only 6 per cent. were so recognized, Bovaird's statement that there is no malady of a similar gravity so frequently discovered for the first time in the *post-mortem* room seems amply confirmed.

In discussing the etiology of this affection the author finds it convenient to treat four different age periods separately—namely, to the end of the second year, when pneumonic conditions prevail; from 2 to 15 years, when rheumatism, pneumonia, scarlatina, and other septic conditions predominate; from 15 to 30 years, when pneumonia, tuberculosis, and septicaemia give rise to most cases; and after 30 years, when Bright's disease and other debilitating diseases make their influence felt.

The section of the book dealing with the signs of pericardial effusion is very instructive, and the various signs are discussed from both the experimental and the clinical aspect. One sign which must have been more frequently quoted in France than in this country has led the author into an historical by-path of some interest. We have referred to the matter (September 16th, 1922, p. 522) in a note on a paper Dr. Blechmann had then recently published, but the story is so interesting and instructive that its main points may here be repeated. Sibson's notch (*l'encoche de Sibson*), an obtuse angle in the left border of the dullness, has apparently been noted at examinations by a generation of French students as a first and decisive sign of pericardial effusion, since attention was drawn to it by Potain in 1887. The author was unable to find a description of any such notch in Sibson's writings, but found instead that he stated that the pericardium when distended with fluid *encroaches* on the left lung. He believes that this word has been erroneously translated as *encoche*. The term has, in this country at least, practically disappeared from current descriptions, and is not of diagnostic value, being present in other conditions. The interest lies in the fact that a sign of at most doubtful value should have been introduced into France with a faulty English title, been reimported into this country, and finally laid low in the country of its illegitimate birth. All the signs are considered with a similar thoroughness, and much attention is paid to the views of Ewart. Those which seem to appeal to the author most are dullness in the fifth right intercostal space, the angle which the right border makes with the liver dullness, the symmetrical increase in cardiac dullness, and the patch of tubular breathing and aegophony at the angle of the left scapula. It is unnecessary to dwell further on the other signs and symptoms which are described and analysed. No part is left undone.

[2] *Les péricardites aigües*. By Dr. Germain Blechmann. Paris: Ernest Flammarion. 1922. (Cr. 8vo, pp. 282; 27 figures. Fr. 10.)

We would draw attention to the author's method of exploring or aspirating the pericardial sac. After an exhaustive investigation into the position taken by the fluid as determined after experimental and clinical observations, he strongly recommends the procedure first practised by Professor Marfan in 1911. The epigastric route is chosen, the needle being inserted in the middle line under the tip of the xiphoid. For the first two centimetres the needle is kept close to the under surface of the bone, and thereafter it is advanced a little obliquely from below upwards through the cellular tissue till it penetrates the pericardial sac. It has been demonstrated that a small quantity of fluid is most likely to be found at this part, and that the danger of puncturing the heart is much less than by the other routes that have been suggested. For exudates found to be purulent the various surgical procedures are discussed.

The book will be found to contain much valuable information, and we have much pleasure in recommending it to our readers.

PHYSICAL EXAMINATION OF THE CHEST.

In his book entitled *Physical Examination of the Chest*,[3] Dr. JAMES CROCKET has gathered together into a compact form a series of lectures customarily delivered to students. As becomes such lectures, they are characterized by directness, lucidity, and dogmatism. Careful classification, frequent headings and subheadings, and divisions annotated numerically combine to produce perfect clarity, and to avoid that confusion which is only too frequently the bane of the most eminent clinicians. The arrangement is straightforward, commencing with a description of the surface anatomy of the thorax, followed by a chapter each dealing with inspection, palpation, percussion, and auscultation. There follows a description of the radiographic examination of the chest, in which particular attention is paid to the appearances manifested in its earliest stages by pulmonary tuberculosis. The insertion of a chapter on laryngoscopy, containing a valuable differential diagnostic table between tuberculous and syphilitic lesions, is amply justified by the importance of the indications so often afforded by affections of the throat. Finally, various classifications of pulmonary tuberculosis which have been suggested, including the Turban-Gerhardt classification and that of the National Association of America, are very suitably added in conclusion.

From the student's point of view especially the book should prove of the greatest value. The subject under consideration is adhered to strictly throughout. The author writes as a clinician, and himself exhibits and encourages others to exhibit those qualities of careful observation and attention which are so difficult to acquire in the present state of crammed curricula and abundant subjects of subsidiary or specialized importance. In its directness, its conciseness, and its eminent readability, the book reminds us of the classical writings of Dr. Gee, and we wish it all the success which attended the works of that famous physician.

BACTERIOLOGY: GENERAL, PATHOLOGICAL, AND INTESTINAL.

KENDALL'S *Bacteriology* is a well known textbook in America, and the second edition[4] has been brought up to date. Dr. Kendall, who is professor of bacteriology in the North-Western University School of Chicago, has made many contributions to the study of the bacteriology of the intestinal tract, and a section of the present volume contains a special chapter devoted to the gastro-intestinal flora of normal infants, adolescents, and adults; in this chapter also the significance of intestinal bacteria and the wholesome activities of the industrious inhabitants of the intestines are justly appraised. Another branch of the science in which Dr. Kendall has carried out valuable research is that which deals with the metabolism of bacteria. It is to this department more than to any other that we must look for the unravelling of the mysteries which attend the subject of the parasitism of bacteria. The physiological method will also probably come to be the only method of classification available, since morphological appearances and even cultural characteristics have failed to differentiate between closely allied strains.

The book before us is divided into five sections. The first deals with general bacteriology and is concerned with the morphology, general physiology, and chemistry of bacteria. Then follows a chapter on bacterial metabolism, in which the author contrasts the growth of organisms in media containing utilizable nitrogenous substances and carbohydrates and in media containing only utilizable nitrogenous substances; in the former case the carbohydrate is used for energy requirements in preference to the protein, which is not at first attacked by the bacterial ferments, whereas in the latter case the protein is made use of from the beginning. This phenomenon is known as the "sparing effect of carbohydrates on proteins"; but the rules the author lays down can scarcely be said to be of universal application, for there are some bacterial species which do not show any selective preference for carbohydrates, and seem, in fact, to hesitate before they finally make use of these sugars. The remainder of this section deals with immunity, questions of technique, and sterilization, antiseptics, and disinfection.

The second section, on pathogenic bacteria, passes in review the different groups of disease producing bacteria. The main facts about each organism are clearly presented, but though the author describes in detail the recent work carried out on the other side of the Atlantic on the grouping of such an organism as the pneumococcus he says little about similar researches undertaken in this country on dysentery, perhaps because they have not been so widely advertised. In general it may be said that this section of the book is not so comprehensive nor so helpful to students as the descriptions found in other standard textbooks.

Section 3 deals with the higher bacteria, moulds, yeasts, filtrable viruses, and diseases of unknown etiology. Reference has already been made to Section 4, on gastro-intestinal bacteriology, and the last section on applied bacteriology explains the bacteriology of milk, soil, water, and air. There are two minor merits of this textbook to which reference should be made, one the manner of printing and the other the illustrations. The headlines and spacings of the paragraphs make the book easily readable, and the 8 coloured plates and 99 engravings illustrate the points described with great clearness. This book is not likely to take the place of the standard textbooks used in this country by students, but it will be a useful reference book, both because the author speaks with the authority of an original investigator in many provinces, and because he has supplied liberal references to articles and monographs dealing with subjects for which he has not felt justified in sparing more space.

BRONCHOSCOPY AND OESOPHAGOSCOPY.

DR. CHEVALIER JACKSON has produced a book entitled *Bronchoscopy and Esophagoscopy*,[5] which is based on an abstract of his larger work, *Peroral Endoscopy and Laryngeal Surgery*, published in 1915. The new book is especially welcome, since it contains everything essential that was to be found in the earlier work, but the bulk has been greatly reduced by the omission of redundant matter and of many unimportant illustrations. The present volume naturally has been brought up to date in certain details.

In the first chapter, one of the most important, entitled "Instrumentarium," the author now describes only the apparatus with distal illumination, with which his name is so closely associated. He thus gives the fruits of his own unique experience in the designing and manipulation of instruments for this work, and any attempt to seek completeness by compilation is avoided. It is a little difficult to understand how anyone can continue to use the older instruments with proximal illumination after experience with Jackson's distally illuminated tubes and specula, the objections to which are purely theoretical. Those who do so continue will find here no support. In this branch of surgery improvisation plays no part; a complete and appropriate selection of instruments and a detailed knowledge of every manœuvre or manipulation that may be necessary to expose and disengage an impacted foreign body are essential to success. Advice as to all this is to be found in the present invaluable book. The author is equally helpful when he writes on the diseases to the examination and treatment of which endoscopy may be applied.

A particularly complete and helpful account of diseases of

[3] *Physical Examination of the Chest.* By James Crocket, M.D., D.P.H., M.R.C.P.E. London: H. K. Lewis and Co., Ltd. 1922. (Cr. 8vo, pp. viii + 254; 53 figures, 14 plates. 9s. net.)

[4] *Bacteriology: General, Pathological, and Intestinal.* By A. I. Kendall, B.S., Ph.D., Dr.P.H. Second edition. Philadelphia and New York: Lea and Febiger. 1921. (Med. 8vo, pp. xi + 680; 99 figures, 8 plates. 6 dols.)

[5] *Bronchoscopy and Esophagoscopy: A Manual of Peroral Endoscopy and Laryngeal Surgery.* By Chevalier Jackson, M.D., F.A.C.S. Philadelphia and London: W. B. Saunders Company. 1922. (Med. 8vo, pp. 346; 114 figures, 4 plates. 27s. 6d. net.)

the oesophagus from the point of view of the endoscopist is given. For example, twenty-nine causes of oesophageal dysphagia are enumerated, an indication of the difficulty and complexity of this aspect of the subject.

The subject of tracheotomy is perhaps scarcely comprised in the title of the book, but it is so closely related and the chapter describing it so full of information derived from the mature wisdom and experience of the author, that he is heartily to be congratulated on including it. A careful study of it should do much to reduce the mortality following this operation. If any portions of the book can be chosen as valuable beyond the rest they would be this chapter on tracheotomy and those entitled "Bronchoscopic foreign body extraction" and "Esophagoscopy for foreign body." No laryngologist can afford to neglect a careful study of this book nor to be without it or its larger parent for reference in case of emergency. There is much, too, that will be helpful to general surgeons, who are frequently confronted with problems on the border-line between general and special surgery.

MEDICAL APHORISMS.

PROFESSOR J. A. LINDSAY of Belfast has published the *Medical Axioms, Aphorisms, and Clinical Memoranda*[6] that have been familiar to several generations of his students. The title recalls and indeed suggests a resemblance to "Clinical Aphorisms from Dr. Gee's Wards" first collected by Sir Thomas Horder in the *St. Bartholomew's Hospital Reports* for 1896, to the latter's *Medical Notes* published two years ago, and to Sir James Fowler's chapter of *Obiter dicta* in his recent (1921) *Pulmonary Tuberculosis*. That there is some resemblance is unavoidable; but there is this wide difference, that whereas his predecessors' collections were practically confined to their own remarks, Professor Lindsay supplements his own aphorisms by a judicious selection from the sayings of over 140 authorities, beginning with Hippocrates and including many still active in teaching. Some of the quotations are from non-medical thinkers, such as Benjamin Jowett, Francis Bacon, and Beethoven.

The contents are arranged under the heads of general remarks, lungs and pleura, the cardio-vascular, digestive, and nervous systems, and miscellaneous (such as alcohol, renal disease, and fevers); the contents of the final category, headed philosophical, are nearly all quotations from others. It is not perhaps safe to assume that the aphorisms without someone's name attached have all been constructed by the author, for among these there is the well known "A man is as old as his arteries," which has not got Cazalis's name appended; and again, "For one mistake made for not knowing, ten mistakes are made for not looking," is certainly familiar in sense if not in this exact form. "Nature is a good physician but a bad surgeon" rings new and true; but "Tell the elderly not to forget *Anno Domini*" does not appear to be entirely a wise counsel, though there may be some ambiguity about what is to be remembered. But as there are nearly a thousand separately numbered expressions of opinion, and the field covered is very wide—with references to quinidine and insulin—it would indeed be remarkable if there was no one open to discussion; besides, many of us derive a good deal of pleasure from reading the aphorisms of others in a critical spirit. To these and other members of the medical profession Professor Lindsay's handy little volume will be a happy hunting ground and source of reference.

SEQUELS OF ENCEPHALITIS LETHARGICA.

THE immense body of literature on epidemic encephalitis which has accumulated in the last few years has so far failed to provide the practitioner with any very clear ideas as to the sequelae or the final prognosis of this distressing disease. Hence Dr. LÉVY's monograph[7] comes as a timely addition to our knowledge and confirms the terrible results which may follow an acute attack of encephalitis lethargica. Her account and conclusions are based on a study of 129 cases in the clinic of Professor Pierre Marie at the Salpétrière; many of the patients have been followed for several years, and some down to their death. After distinguishing between the symptoms which arise during the acute period of the disease, even when this is prolonged, and those which follow after a period of latency, the author points out that this latent period may vary very much—from, in fact, a few weeks up to or even more than two years. Another point of great importance is that the initial form of the disease is no criterion of the form which any sequelae may assume. Thus a case which in the acute period has shown the myoclonic syndrome may later develop the Parkinsonian syndrome, and so on.

In a classification of the sequelae the author found that no fewer than 73 showed the Parkinsonian syndrome, the so-called symptomatic paralysis agitans, a fact confirming the experience of many in this country; 43 cases showed excito-motor syndromes, including various forms of involuntary movements, choreiform, myoclonic, localized movements of the face, and what the author terms bradycinesis, by which we understand a slow involuntary movement rather resembling the movements of athetosis. Other sequelae of especial interest are obesity and disturbances of the respiratory rhythm.

The clinical descriptions of these various syndromes are full of detailed interest and are a monument of careful study, the account of the Parkinsonian syndrome being particularly good. It is perhaps to be regretted that the author has not been able to include a more detailed study of the mental disturbances which may follow the disease, for greater knowledge of such forms of psychosis is badly needed.

There are short sections on the morbid anatomy and the pathogenesis. In four cases of the Parkinsonian syndrome atrophy of the cellular elements was found in the basal ganglia and locus niger and in one case degeneration of the myelin in the centrum ovale. It is especially interesting to note that in one case the persistence of signs of active lesions was observed—for example, perivascular infiltration—in the mesencephalon. The author concludes that it is reasonable to suppose that in a certain number of cases the virus remains active. There is a useful chapter on the changes in the cerebro-spinal fluid and their diagnostic value.

There are a good bibliography and some valuable illustrations. Enough has been said to show that Dr. Lévy has given us a very valuable study. We hope that neurologists in this country will follow her example and let us have the benefit of their experience in this very important matter.

THE COMPOSITION OF SCIENTIFIC PAPERS.

> "Every man who understands the art of writing, and has tried to write well, is aware that the process of composition is commonly not the simple transference of thought into language, but the laborious attempt to work into a coherent shape ideas which have been in his mind, but which have still to be clarified and arranged."

COMING upon these words one day in an article on "The decay of syntax," our thoughts turned at once to Sir CLIFFORD ALLBUTT and his book of counsel to medical writers. At that time the second edition of *Notes on the Composition of Scientific Papers* had been out of print several years, and those needing literary first aid were complaining that they had to borrow the book or go without. The third edition,[8] so many years overdue, has now appeared, and we welcome it almost like the return of a long expected friend. Scanning its features with the affectionate interest proper to such occasions, we find at first glance everything much as before; the familiar green cover is there, the print is the same, the size and shape of the page are unchanged. The author's accumulated honours and distinctions of eighteen years have, of course, left their traces on the title-page. A few pages—some twenty or so—have been added in all; there is now a short index to help the diligent reader, and a still shorter appendix forming a kind of kennel for dog-latin words.

On closer study, and comparison with the edition of 1905, we perceive many marks of a pruning knife wielded with a firm hand. This is by no means a reprint, but a new edition very thoroughly revised in every part. Sir Clifford Allbutt has edited himself unflinchingly; it is the same book, yet not quite the same; here a little has been put in, there a little taken away. Let it be said at once that every word of the added matter is good and to the point, but rigorous revision has cast out some familiar passages which many will think

[6] *Medical Axioms, Aphorisms, and Clinical Memoranda.* By James Alexander Lindsay, M.A., M.D., F.R.C.P., Professor of Medicine in the Queen's University of Belfast. London: H. K. Lewis and Co., Ltd. 1923. (Cr. 8vo, pp. viii + 192. 6s. net.)

[7] *Contribution à l'Etude des Manifestations Tardives de l'Encéphalite Epidémique.* By Dr. Gabrielle Lévy. Paris: Vigot Frères. 1922. (Roy. 8vo, pp. 314; 53 figures. Fr. 18.)

[8] *Notes on the Composition of Scientific Papers.* By the Right Hon. Sir T. Clifford Allbutt, P.C., K.C.B., M.A., M.D. Third edition. London: Macmillan and Co., Ltd. 1923. (Cr. 8vo, pp. 192 + xiv. 6s. net.)

too good to lose. Remembering its purpose, few would have grumbled had the book grown with the passage of time.

The preface seems largely new. In Chapter I we find a fresh paragraph on names and terms, a greater emphasis on the need for lucidity in composition, and a caution against the abuse of hospital, laboratory, and military slang. In Chapter II the section on participles and gerunds has been expanded; and the "woolly style," with its "litter of idle words," is now attacked with a larger battery. Time, we note with satisfaction, has deepened the author's dislike for such borrowed words as questionnaire, résumé, and rôle; and we may feel sure that he would subscribe to Mr. John Bailey's opinion that "the only safe rule when writing English is to write it, never using a foreign word where an English one exists." The split infinitive and other uncouth suspensions tease him as much as ever. His indictment of the split infinitive is as good as anything in the book; yet we cannot help thinking that, while the general rule is sound, it may be pedantic always to invert the phrase in order deliberately to avoid the split. But we must not be tempted into detailed discussion; nor must we, by debating verbal niceties, suggest to those who are not familiar with this little classic that Sir Clifford Allbutt puts form above substance, style above stuff. A sentence from the preface may therefore be quoted:

"It is far from my intention in these simple instructions to advocate a manner of writing in which pith and character are lost in polish or affected elegance; indeed, my purpose is literary only so far as to insist on the qualities of clearness, precision, and definition."

Enough has been said, we hope, to commend this new edition to our readers, young and old. Changes have been made, but the spirit of the book burns as brightly as ever. If we should seem to write of it with too much enthusiasm we reply that the medical editor by the nature of his work feels more often than others the need of such advice. Some may think the standard set too high for ordinary mortals; nevertheless the reading and re-reading of this small treatise will help us so to order our thoughts and fashion our language, that when we have something to say we may write it in the fewest and the best words and no one can doubt our meaning.

NOTES ON BOOKS.

The Yearbook of the Universities of the Empire[9] has become a reference volume indispensable to all interested in university and professional education. It summarizes the calendars of the sixty-six universities and colleges of the British Empire, and into a volume of manageable size, without sacrificing intelligibility to brevity, the editor compresses details of their degrees, courses of study, staffs of professors and lecturers, and other essentials. In the present edition the new University of Delhi, the West Indian Agricultural College, University College, Colombo, and the King Edward VII College of Medicine, Singapore, appear for the first time. One section of the appendix deals, in a rather briefer way, with foreign universities all over the world; another section gives a summary of British medical and dental qualifications and the requirements necessary for registration; and another is devoted to a short account of the scholarships and grants for research available in this country and abroad. The index of names at the end of the volume we have in previous years found useful and accurate for ascertaining quickly the university or college at which any particular British scientist holds an appointment and its precise title.

The *Minutes of the General Medical Council and of its Various Committees for the Year 1922* (Vol. LIX) has been issued.[10] The volume contains twenty appendices, of which the most important are those giving the Education Committee's report on the revision of the curriculum in medicine, and the Public Health Committee's report on the revision of the regulations and rules for the diplomas and degrees in sanitary science, public health, and State medicine. In 1903 the Council issued an index to its minutes, and it was then determined not to allow so long an interval to elapse in future. A new edition was issued in 1908, and the index has since been kept up to date. The issue for this year[11] covers the twenty years 1903–1922.

[9] *The Yearbook of the Universities of the Empire, 1923.* Edited by W. H. Dawson, and published for the Universities Bureau of the British Empire. London: G. Bell and Sons, Ltd. 1923. (Cr. 8vo, pp. x + 632. 7s. 6d. net.)

[10] London: Constable and Co., Ltd. 1923. 12s.

[11] London: Constable and Co., Ltd. 1923. 7s. 6d.

Some years ago Dr. E. LE BEC wrote a book, *Preuves Médicales du Miracle*, which is well known to the majority of those who have taken an interest in Lourdes. It has now been translated into English by Dom H. E. IZARD, O.S.B., L.R.C.S., M.R.C.P., under the title *Medical Proof of the Miraculous*.[12] It is almost entirely concerned with Lourdes, where Dr. Le Bec holds an official position. Dr. Ernest E. Ware, senior surgeon, Hospital of SS. John and Elizabeth, London, has written a brief introduction for the English edition.

In the footnote to the notice of the *Annals of Medical History* published last week (p. 383) it should have been stated that Messrs. Baillière, Tindall, and Cox are the English agents and that the annual subscription is £2 2s. post free.

[12] *Medical Proof of the Miraculous: A Clinical Study.* By E. Le Bec, Honorary Surgeon to St. Joseph's Hospital, Paris. Translated from the French by Dom H. E. Izard, O.S.B., L.R.C.S., M.R.C.P. London: Harding and More, Ltd. 1922. (Cr. 8vo, pp. xv + 198. 6s.)

A CONTRIBUTORY HOSPITAL SCHEME.

WE have received the following letter, dated February 26th, from Major P. A. S. Crawley, chairman of the Sussex Provident Scheme for Hospital and Specialized Medical Services (4, St. George's Place, Brighton):

Since you first drew attention to the Sussex Provident Scheme, a little over two years ago, a number of similar contributory schemes have been established all over the country, and it may interest some of your readers who are connected with the other organizations to learn how the Sussex Scheme has fared during the past year.

The Group Scheme started on April 1st last year and has proved a great success. The number of co-operating hospitals has increased from nine to eleven, but the administration remains in the hands of a neutral body not connected with any particular hospital, and not seeking representation upon the boards of management of the hospitals. The membership—that is, 4,200 subscribers, and those of their dependants who are beneficiaries under the scheme—amounts now to over 10,000, and is rapidly increasing.

Although in two cases during the year we have had to pay a hospital over £60 for one member, we have been able to pay every co-operating hospital in full the out-of-pocket cost of their services to our members, based upon the average cost of such services in the year 1921, with the result that since the scheme has been in existence none of our members has depleted the charitable funds of any of the co-operating hospitals of one penny.

With regard to the hospitals not co-operating with us, we are unable to deal direct, and can only repay our members such charges as may have been made to them, but our co-operating hospitals have agreed that when presenting themselves for treatment with their card of membership, and a letter of recommendation from their private doctor, our members shall not be subjected to any almoner's inquiry as to their means or asked for any contribution for their maintenance or treatment while attending the hospital, the bill being subsequently sent to the committee of the scheme by the hospital for payment.

We have sustained a great loss in the death of Viscount Selby, who was our honorary secretary, and to whose disinterested service the success of the scheme is mainly due.

I enclose the balance sheet of the year's working.

The document to which Major Crawley refers as the balance sheet may perhaps be more accurately described as a statement of receipts and expenditure for the period January 1st to December 25th, 1922. This document may be summarized as follows:

Receipts.

	£	s.	d.
Subscriptions:			
Individual Scheme	419	7	6
Group Scheme	1,501	4	0
	1,920	11	6
Less received in advance for 1923	654	14	0
Total subscriptions, 1922	1,265	17	6
Add interest on deposit account	9	9	5
	£1,275	6	11

Expenditure.

	£	s.	d.
Payments to hospitals	1,010	17	0
Other payments	55	7	0
Administration	159	5	10
Sundries	4	13	6
	£1,230	3	4

Leaving a balance on the year's working of £45 3s. 7d., which, added to the amount brought forward from 1921, £54 12s. 5d., gives the total balance in hand and carried forward £99 16s.

The statement does not make it clear whether there are any liabilities outstanding against this, nor does it appear by what asset this balance is represented.

Pasteur Centenary Celebration in London.

ADDRESSES ON PASTEUR AS A BACTERIOLOGIST, CRYSTALLOGRAPHER, AND ARTIST.

MEETING AT THE ROYAL SOCIETY OF MEDICINE.

THE centenary of the birth of Pasteur was celebrated at the social meeting of the Royal Society of Medicine on Wednesday, February 28th. Among the guests received by Sir William Hale-White (the President of the Society) and Lady Hale-White were Count de Saint-Aulaire (the French Ambassador in London), M. Bonzon (French Consul-General), M. Billecocq and M. Marchat (Assistant Consuls), M. Audra (Institut Français), M. André Simon (President of the Alliance Française), M. Leroux (President of the Committee of French Societies in London), and M. Pierret (Chairman of the French Hospital). A number of the delegates at present in London from seventeen countries attending the second Interchange of Health Officials, organized by the League of Nations, were also present, and there were representatives from the various offices of the British Dominions. The Fellows of the Society and their friends were present in such numbers that the Barnes Hall was overcrowded. The British and French flags were draped over the President's chair, and over a portrait of Pasteur in his laboratory which was exhibited on the platform.

Sir William Hale-White, at the outset of the proceedings, read a letter which had been received from the President and secretary of the Academy of Medicine of Paris, expressing good wishes for the success of the celebration, and stating that they had appointed an Associate of the Academy, Sir Almroth Wright, to represent them. The letter went on to say that the Academy was deeply grateful to the Royal Society of Medicine for rendering this homage to the great Frenchman. "The bonds which unite to-day French science and thought with British science and thought are very strong, and the mutual affection between the two countries is so cordial that every celebration of a great man, be he of one or other nation, is sure to evoke on either side of the Channel the same enthusiasm. Therefore France and Great Britain will march proudly hand in hand for the glory of science and the benefit of humanity."

Three addresses on different aspects of Pasteur's life and work were then delivered. Sir William Hale-White spoke of Pasteur in relation to medicine; Professor T. M. Lowry, F.R.S., on Pasteur in relation to chemistry; and Dr. Gustave Monod, delegate of the Faculty of Medicine of Paris, on Pasteur as artist. Dr. Monod presented to the Royal Society of Medicine for its library a portfolio of reproductions of portraits done by Pasteur as a youth, published in Paris in 1910 with the title "Pasteur, dessinateur et pastelliste." Dr. Monod said that he made the presentation as an expression of admiration for the Society and his "everlasting gratitude towards the noble and hospitable city of London." With the kind permission of M. René Vallery-Radot we are able to reproduce on a reduced scale three of the portraits from the portfolio—that of Pasteur's mother, drawn when he was 13 years of age; that of his father, drawn at the age of 16; and that of Constance Parpandet, a member of a religious community, made when she was 82 years of age and Pasteur 18.

PASTEUR IN RELATION TO MEDICINE.

Sir WILLIAM HALE-WHITE, President of the Royal Society of Medicine, said:

Louis Pasteur was born on December 27th, 1822, at Dôle. It was a remarkable time in the history of medicine. Jenner, whose fame was world-wide, was still alive. Laënnec, that prince of observers, had, two years before, published *L'Auscultation Médiate*, and the thin, bony man, already marked for death by phthisis, began his first course of lectures at the Royal College of France three weeks before the day of Pasteur's birth. Bright, who became the best known British physician since Harvey, had settled down at Guy's Hospital, where he made his immortal observations. All these four were for a month alive at the same time; the three elders owe their celebrity to having had, to an exalted degree, the faculty of observing the experiments made by nature; the infant just born attained his by observing the experiments he made himself; but all four were indomitable workers, marvellously accurate observers, and with them all mere doctrines were made to yield to truth.

Pasteur's father was a tanner who had, in the Napoleonic wars, been created a Chevalier of the Legion of Honour on the battlefield. He was fond of reading and had much influence on Louis, who said on the death of his father: "For the last thirty years I have been his first and almost his only interest in life. I owe everything to him." The old soldier was intensely patriotic and impregnated his son with ardent patriotism, which led him in 1871 to return to the University of Bonn the diploma of the honorary degree of M.D.

> "The sight of this parchment is now hateful to me, and I feel it an insult to have my name . . . associated with one doomed from henceforth to the execration of my fellow countrymen—that of Rex Gulielmus."

Likewise in 1895 he refused the Prussian Order of Merit.

Pasteur was appointed Professor of Chemistry at the University of Strasbourg in January, 1849, within a fortnight he had fallen in love with the daughter of the rector, M. Laurent, and they were married on May 29th of the same year. She, during the whole of their married life, appreciated that she had become the helpmate of a great genius. When he was working on a problem he became oblivious to the outside world. He once forgot that he had promised to take her to an important festivity; she waited hours, he did not come, but there was no reproach from her. On occasions she had either to send or to fetch him home from the laboratory to his meals; if not he worked on for hours forgetful of time; she shielded him from all domestic worries. She was never jealous of his devotion to science; in the evening she took down notes of the day's work from his dictation, and helped him to state things clearly by asking him for explanations; not only was she an incomparable companion but his best collaborator. That he would have given less to humanity had he married a different wife must be true. The world owed much to Pasteur's wife. Sir William then related how Pasteur was led to study micro-organisms by the observation that the common mould *Penicillium glaucum*, growing in a liquid containing para-tartaric acid, consumed only the dextro-rotatory tartaric acid, leaving the laevo-rotatory untouched.

Pasteur went from Strasbourg to be Professor and Dean of the Faculty of Science at Lille, where alcohol was manufactured from beetroot by fermentation. The father of one of his pupils was in difficulties because sometimes the process turned out badly. The nature of fermentation was not then understood, but Pasteur showed that the formation of alcohol from sugar was a vital process connected with the growth of a specific micro-organism which performed the conversion, and that another specific micro-organism had the property of forming lactic acid from sugar. From Lille he went to the École Normale in Paris, where his laboratory was two attics, and he had no assistant. The studies on fermentation were continued, and he showed that butyric acid fermentation, several diseases of wine, vinegar, and beer were all due to micro-organisms, which he divided into two great classes: aerobes, requiring free oxygen to maintain their life; and anaerobes, capable of living without free oxygen, but able to wrest this element from its combinations with other elements. All this is common knowledge, and it is difficult to put ourselves back fifty years when it was not. Dumas the chemist begged Pasteur to study silkworm diseases, which were then causing thousands of people to be without a means of livelihood. Pasteur went to live in the district, spent five or six years on the subject, showed that there were two diseases, that each was due to a micro-organism, and each was communicable from worm to worm. Having found the cause, it was easy for Pasteur to show how to prevent the malady, and the large poverty-stricken districts were restored to prosperity.

When investigating chicken cholera, a disease of fowls due to a micro-organism, Pasteur discovered that if these micro-organisms were left for a long while in the laboratory to live on a suitable soil they gradually lost their excessive virulence owing to the long exposure to the oxygen of the air. If now fowls were inoculated with these micro-organisms of weakened or attenuated virulence, the birds were made only slightly ill, and, if subsequently inoculated with the virulent micro-organism, showed no signs of disease, although fowls inoculated with the same micro-organism, but not previously inoculated with the attenuated virus, quickly died. He had made the grand discovery that it was possible to attenuate the virulence of a micro-organism outside the body, and that inoculation with the attenuated virus protected against the disease. This doctrine of attenuation of the virus is of fundamental importance in bacteriology and preventive medicine, and its discovery was one of Pasteur's greatest achievements.

Sir William Hale-White then sketched the manner in which Pasteur succeeded in attenuating the virus of anthrax and that of swine fever, and the application of the attenuated virus for the protection of flocks and herds; considering, he said, Pasteur's work on diseases of wine, beer, vinegar, silkworms, chicken cholera, anthrax, and swine fever, it was easy to see the truth of Huxley's remark: "Pasteur's discoveries alone would suffice to cover the war indemnity of five milliards paid by France to Germany in 1870."

Soon after Pasteur began the study of micro-organisms he saw that his work must bear on medicine, for in 1863, in an interview with the Emperor, he assured him that all his ambition was to arrive at the knowledge of putrid and contagious diseases. Pasteur's work on fermentation led him to the conclusion that putrefaction, like fermentation, was due to micro-organisms which were usually derived from the air. Quite early he showed that when urine decomposed to form ammonia a special micro-organism was at work, and that its activity could be inhibited by boracic acid; consequently this acid was successfully used in medicine for this purpose.

SOUVENIR MEDAL OF THE CENTENARY OF PASTEUR'S BIRTH (SLIGHTLY ENLARGED).
The medal is issued by the Association for the Extension of Pastorian Studies (11, Rue Anatole-de-la-Forge, Paris, 17). The portrait was selected by Madame Vallery-Radot (Pasteur's daughter) as the most faithful likeness of her father. The object of the Association is to encourage well qualified men and women to take up biological research in relation to medicine, agriculture, and industry.

He had not any medical qualification, nor any clinical training; nevertheless, to his great delight, he was in 1873 elected by a majority of one vote to the Academy of Medicine. He was a constant attendant, always urging the importance of micro-organisms in disease, always fighting old-fashioned members who denied this.

But the greatest of all the triumphs that followed from his investigations was, unknown to him at the time, evolved in this country. The mortality due to putrefaction of wounds, whether accidental or inflicted by the surgeon, was appalling. But when Lister learnt that Pasteur had shown that putrefaction was a fermentation caused by the growth of microbes, and that these could not arise *de novo* in the putrescible substance, a solution of the problem appeared. He revolutionized surgery by proving that putrefaction after operations could be abolished if the patient's skin, the surgeon's hands, the sponges, dressings, and instruments were all so treated that they had no living micro-organisms attached to them, and also that if micro organisms were already there, as they often were after injury, the wound would heal without the onset of blood poisoning if they were rendered inert or removed. At the meeting of the International Medical Congress at Copenhagen in 1884 Lister, addressing Pasteur, said:

"Truly there does not exist in the whole world an individual to whom medical science owes more than to you. . . . Thanks to you surgery has undergone a complete revolution, which has deprived it of all its terrors and has increased its efficacy to an almost unlimited extent."

Hydrophobia or rabies, Sir William said, was communicated by dogs or wolves to man by biting. The suffering was dreadful. He had seen people die of it, and could testify that the illness was the most horrible of those with which mankind could be afflicted; untreated it was fatal. The micro-organism was unknown, but Pasteur showed that the virus resided in the nervous system, by injecting an emulsion of the spinal cord of a mad dog into a healthy dog and thereby causing rabies in it which did not show itself for fourteen days. This, then, was the incubation period. He transmitted the disease by inoculation to a rabbit and from rabbit to rabbit until the ninetieth rabbit was reached, and found that by this means the incubation period was reduced to seven days. By suspending in air the spinal cord of a rabbit dead of rabies having this short incubation period he was able, because of the oxygen in the air, to attenuate the virus so that when an emulsion of such a spinal cord was injected into a dog the animal did not suffer from rabies, nor did he get rabies when inoculated with a virulent spinal cord from a mad dog. In other words, the healthy dog had been successfully vaccinated against rabies. In man the incubation period was long; Pasteur inoculated human beings recently bitten by a mad dog with a rabbit's spinal cord containing the attenuated virus having the short seven days' incubation period, and found, to his intense delight, that they did not get rabies. By this treatment, he said, rabies in human beings bitten by mad dogs and wolves could be prevented if they came for treatment sufficiently soon after the bite. An English commission appointed by Government to investigate the matter reported that he had proved his claim.

Pasteur was a tremendous worker; I have not mentioned the immense labour he spent in refuting the doctrine of spontaneous generation. But he was much more than a worker—he was an enthusiast; when he gave up chemistry he wrote: "I who did so love my crystals." He rushed about the country in pursuit of his investigations; at the age of 46 he had a cerebral haemorrhage, but doctors' directions that he must work less made no impression; he never attended social gatherings nor theatres, but he fought all who disagreed with him; his friends thought he wasted time on this, but, as Tyndall said: "Pasteur is combustible and contradiction readily stirs him into flame." This was not because he sought personal glorification—he was most modest—but because he must at all costs uphold what he knew to be correct. He was a marvellous experimenter, proving his assertions up to the hilt by simple but uncontrovertible experiments in which he had guarded against every error. He was an implacable critic of his own and other people's experiments. He had the infinite capacity for taking pains and an intuition for devising just the right experiment. If an analogy suggested itself no use was ever made of it until it had been submitted to experimental verification, but facts fell upon his mind like seeds on a fertile ground, and he had a wonderful faculty for discerning their relative importance. He was fond of saying that "In the fields of observation chance only favours the mind which is prepared."

Then, too, he had the magnetism which made others love to work with him and follow his inspirations; he attempted so much that if it had not been for helpers much must have been left undone. He was a genius, a seer, and a prophet, always adding to knowledge, always looking forward to more additions. "Science," he said, "has no nationality because knowledge is the patrimony of humanity, the torch which gives light to the world. Science should be the highest personification of nationality, because, of all nations, that one will always be foremost which shall be first to progress by the labours of thought and of intelligence."

PASTEUR AS A CHEMIST.

Professor T. M. LOWRY, F.R.S. (Cambridge), said:

In the brief time at my disposal I shall attempt only two things: first, to present in outline a picture of the work which won for Pasteur the chemist a place in the ranks of the Immortals; second, to indicate the bridge by which his chemical work is linked to those biological researches which enabled a mere chemist to claim the attention of a society such as that which I have the honour to address. My task has been made easy by Pasteur himself, since rather more than sixty years ago he delivered to the Chemical Society of Paris two lectures which cover precisely the same field as that into which I propose to guide you to-night.

Pasteur claimed that in his work on tartaric acid he was following in the footsteps of three physicists—Malus, Arago, and Biot. Malus, in 1808, had announced the discovery of the polarization of light by reflection—that is to say, that light reflected from a sheet of glass was altered in such a way that the vibrations in one plane entered the glass, whilst the vibrations in the perpendicular plane were reflected from it. The plane which contained the incident and reflected ray was described as the *plane of polarization*. Arago, in 1811, discovered that when a ray of polarized light was passed through a plate of quartz the plane of polarization was distorted, giving rise to beautiful chromatic effects. Biot, in 1812, made the further discovery that this distortion took the form of a uniform rotation of the plane of polarization, but that some plates of quartz rotated this plane to the right and others to the left. He also discovered, in 1815, that a similar rotation of the plane of polarization was produced by many natural products, such as oil of turpentine and solutions of sugar, of camphor, or of tartaric acid.

We now pass on to consider the relation between the geometrical form of the crystal and its ability to rotate the plane of polarized light. A typical crystal of quartz consists of a hexagonal prism capped by hexagonal pyramids. Haüy, however, detected the presence of tiny facets on the alternate corners, which made the crystals lopsided or asymmetric; he also found that these hemihedral facets could be distributed in two ways, giving rise to crystals which could not be superposed upon one another, although they could be converted into one another by reflection in a mirror. Quartz crystals could, therefore, assume two different geometrical forms, whilst plates of quartz could rotate the plane of polarization of light in two opposite ways. It was left to Sir John Herschel, in 1820, to discover the correlation between these facts, and to show that crystals having one geometrical form always rotated the plane of polarization to the right, whilst those of opposite form rotated it to the left.

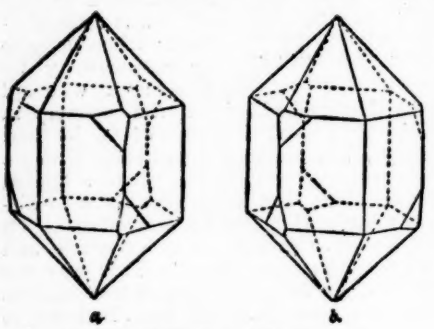


FIG. 1.—(*a*) Dextro-rotatory quartz. (*b*) Laevo-rotatory quartz.

I now pass on to consider Pasteur's discovery of similar phenomena in tartaric acid. This acid was known in two forms—the ordinary dextro-tartaric acid, which rotated the plane of polarization to the right, and a modification (which Pasteur called *para*-tartaric acid), which possessed identical chemical properties, but was devoid of optical rotatory power. Pasteur found that tartaric acid and its salts all gave asymmetric crystals, like quartz, whilst the *para*-tartrates gave symmetrical crystals. It appeared, therefore, that there might exist a correlation between the asymmetric crystals of the tartrates and the optical rotatory power of their solutions, similar to that which existed between the asymmetric crystals of quartz and the optical activity of solid plates cut from the crystal.

At this stage Pasteur's attention became fixed upon an observation of Mitscherlich's to the effect that one of the salts of *para*-tartaric acid gave rise to crystals of precisely the same type as the corresponding tartrates. When Pasteur investigated this anomaly he found that, contrary to all previous experience, hemihedral facets appeared on the crystals of the optically inactive *para*-tartrate as well as of its dextro-rotatory isomer. Further examination of this anomaly showed, however, that whereas in the dextro-rotatory tartrate the hemihedral facets were always of one kind, in the *para*-tartrate both types of crystal were formed side by side from the same solution. It appeared, therefore, that when this particular salt was crystallized the *para*-tartaric acid resolved itself spontaneously into two opposite forms of tartaric acid, one of which had been known for nearly a century, whilst the other, its mirror image, was new to science. It is of interest to notice that in no other known case does this spontaneous resolution of an inactive tartrate take place, and that even the two sodium ammonium salts unite to form a double salt above 26°C. It is, therefore, quite possible that Pasteur's life work might have taken a totally different course if he had begun his work in a tropical instead of in a temperate climate.

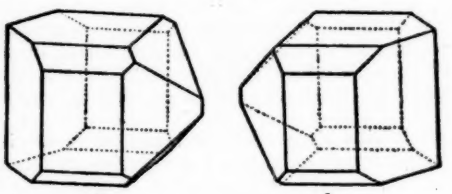


FIG. 2.—(*a*) Dextro-tartaric acid. (*b*) Laevo-tartaric acid.

Pasteur was a young student at the time when he made this important discovery, and before communicating the results to the Academy Biot insisted that Pasteur must come to him and repeat before his own eyes the decisive experiment. "He provided me," says Pasteur, "with some *para*-tartaric acid, which he had already studied with particular care and which he had found to be perfectly neutral towards polarized light. I prepared the double salt in his presence, using for the purpose soda and ammonia, which he had also wished to provide for me himself. The liquor was left in one of his rooms to evaporate slowly, and, when it had furnished 30 or 40 grams of crystals, Biot asked me to come to the Collège de France in order to collect them and to separate them under his eyes by their crystallographic character into right and left crystals. He also asked me to state again whether I could assert that the crystals which I placed to his right would rotate the plane of polarization to the right and the others to the left. That done, he told me that he would do the rest. He prepared the solutions of carefully regulated strengths, and, at the moment when he was about to observe them in the polarimeter, he invited me afresh to come into his room. He placed in the apparatus first the most interesting solution, that which would rotate the light to the left. Without stopping even to make a measurement, he saw, by a single glance at the colours of the ordinary and extraordinary images in the analyser, that there was a strong deviation to the left. Then, visibly moved, the illustrious old man grasped my arm and said to me, 'Mon cher enfant, j'ai tant aimé les sciences dans ma vie que cela me fait battre le cœur.'"

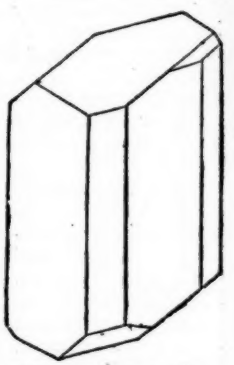


FIG. 3.—Racemic acid.

The optical rotatory power of quartz is due, as Fresnel had suggested, to a spiral packing of the molecules, and by the kindness of Sir William Bragg I am able to exhibit a model in which the spiral distribution of the atoms of silicon is clearly shown. This spiral structure can be built up in two opposite ways, but when it is destroyed (for example, by melting the quartz) the optical rotatory power vanishes. The asymmetry, then, is in the crystal, but not in the molecules of silica from which it is built up. Tartaric acid, however, displays its optical activity in solution, and we owe to Pasteur the momentous declaration that the *molecules* of tartaric acid, as well as the crystals, must be asymmetric. Here, again, through the kindness of Sir William Bragg, I can show you a model which illustrates both the spiral arrangement of the carbon atoms in tartaric acid and the way in which these spiral molecules are packed together in an asymmetric crystal.

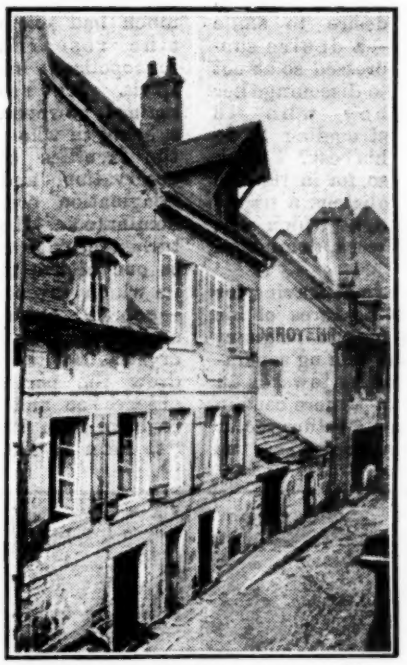
Just a word in reference to the biological applications of these discoveries. Pasteur called attention to the fact that in the mineral kingdom, and by the artificial operations of

the chemical laboratory, asymmetric molecules are always produced in equal quantities of opposite types, giving rise to optically inactive compounds or mixtures. Nature, however, almost invariably produces optically active products; and all the materials of the living tissue are branded with this symbol of their divine origin. This, then, is the real distinction between the organic and the inorganic, between nature and man, and this "middle wall of partition" Pasteur was the first to break down. It is indeed a remarkable fact that the three methods which to-day enable us to accomplish the final stage in the synthesis of natural compounds, by endowing our synthetic products with optical activity, were all described by Pasteur more than sixty years ago.

One other link between Pasteur's delicate chemical studies and biology may be mentioned. The mould which ferments ordinary tartaric acid has but little action upon its optical isomer. It was therefore possible by fermenting *para*-tartaric acid to destroy the common dextro-rotatory form, whilst preserving the laevo-rotatory isomer. The yeast, trained for countless generations to assimilate dextro-tartaric acid, refuses to ferment laevo-tartaric acid, and turns away with loathing from the unaccustomed food. This phenomenon has been widely extended, and applies not only to humble organisms but to man himself. Thus, whilst one form of asparagin tastes sweet in the mouth, the mirror image has an insipid taste. If, therefore, through some freak of nature the asymmetry of the vegetable kingdom were reversed, whilst leaving that of the animal kingdom unchanged, we too, like the yeast, might starve in the midst of plenty, unable to digest the unaccustomed sugar with its facets at the wrong corners, or to nourish ourselves upon the finest wheat flour containing starch and gluten of the wrong sign.

This, surely, is the real tragedy of "Alice through the Looking-Glass." The buns and cakes beyond the mirror would present a tempting appearance; the toffee and the barley sugar would still attract her; but if she should stretch out greedy hands and grasp them through the mirror, she would be doomed to disappointment. The fats she would be able to digest, and it might still be necessary to warn her to leave the wine decanter alone, since the alcohol has a symmetrical molecule, and would be equally potent from whichever side of the mirror it was derived; but the carbohydrates and proteins would probably "turn to ashes" in her mouth and provide her with little or no nourishment. Even if she should succeed, however, in finding sufficient food, her growth would certainly be arrested by lack of optically active vitamins of the right sign, and death would certainly await her, perhaps the more merciful if not long delayed. Would insulin be of any value to her in the terrible state into which she would inevitably lapse as a result of wandering to the wrong side of the looking-glass? Even the seven happy years that I spent at Guy's have not qualified me to attempt a prognosis, even when as in this case my diagnosis must be accepted as correct. But, greatly daring, I will assert that all the efforts of the Medical Research Council would fail to save Alice, for the remedies that they would prepare on this side of the looking-glass would have no potency in enabling her to assimilate the strange food on the other side of the glass. Alice must begin all over again, and beyond the mirror organize a medical research council of her own. We should recognize them easily, for the wise inhabitants of that other world would know that they could not do better than to reflect "our" choice, and confirm "our" nomination (I speak on behalf of all the inhabitants, both fauna and flora, of our side of the mirror). But they would have some strange habits. Their hair would be parted on the wrong side; they would carry their watches in their right-hand pockets and listen to the beating of hearts on the right side of their patients. In their moments of leisure they would play golf with clubs of an unfamiliar type, with which they would make magnificent left-hand drives; but their handicaps and their feelings would remain the same, since these things are not altered by reflection in a mirror. They would then manufacture from materials gathered on the other side, suitable and potent remedies for the diseases of that other world; and they would apply these to Alice. At last she would look forward to a cure, but only to meet with fresh disappointment, since the cure would prove to be only a treatment of her disease, for after all Alice herself must undergo optical inversion, limb by limb and molecule by molecule, turning her right hand into a left and reversing the sign of her tissues, as her body passed through the plane of the mirror, before she could fit harmoniously into the framework of the universe beyond. And there at last we may leave her, happy and contented, and enjoying all the good things that life "through the looking-glass" has to offer.

Such, briefly, is the concept which Pasteur places before us as his earliest contribution to natural knowledge; and we cannot but admire the perfect fashioning of the foundation stone upon which in his riper years he built up the splendid monument, which generations still unborn will visit, in order to lay before it a tribute of laurel leaves such as we bear in our hands to-night.



HOUSE WHERE PASTEUR WAS BORN IN DÔLE (with a commemorative plate above the door).

PASTEUR AS ARTIST.

Dr. GUSTAVE MONOD, M.R.C.P.Lond., gave a short lecture on Pasteur as an artist, illustrated by reproductions of some of Pasteur's drawings.

Great men, he said, presented themselves for our study under many different aspects, and we had to regard Pasteur as pioneer, professor, advocate, patriot, and believer, and still more intimately in his home. Pasteur was an artist, not only in the usual sense of the word, but also in the sense of the Latin word *artifex*—a man who translated his ideal of beauty into his life's work. From his childhood Pasteur had known how to observe and how to depict what he observed. Twenty of the portraits he made when a boy were published in 1910, in a limited edition, but, excellent as the reproductions were, they could not give the impression of intense life which the originals preserved in the house of Pasteur's son-in-law, M. Vallery-Radot, conveyed. In that house the home of the Master lived again; his furniture, his work table, his books, and his favourite pictures were all there; his whole life was told in pictures—from the portrait of himself as a young man by Lebayle, passing on to the picture by Eberfeldt, and ending with the poignant drawing of the serene face of the great man sleeping his last sleep.

"Arbois," continued Dr. Monod, "is a little town of eastern France at the foot of the Jura; its hills and clear, rapid streams recall the Highlands of Scotland. Taking ourselves back to 1831, we could imagine a band of noisy children coming home along the river bank from fishing. One of them, a boy small for his thirteen years, attracts attention by his thoughtful expression, and the passers-by smile, saying, 'This is Louis, the son of M. Pasteur, the tanner, our young artist.' For Louis Pasteur, without being in any way an infant prodigy, early distinguished himself by his aptitude in drawing. Doubtless, if we possessed his boyhood's exercise books, we should find in the margins more or less unskilful sketches of his comrades taken from life, and, I should wager, caricatures of his first masters, among them naturally that of the teacher of drawing at the school, M. Pointurier; he was a jovial man, not devoid of talent; he drew as naturally as he breathed and allowed his pupil to develop faculties according to their natural bent. But Louis at the age of 13—the age of daring—dared to attempt a real portrait. Ah! if he could fix upon the paper the most familiar, the dearest, the loveliest of faces. . . . His heart tells him that, though the busy grown-up folk will not find time to sit for him, his mother will understand her child. The others have faces that are unknown and difficult, but

the face of his mother is a landscape of which he knows every secret. 'Oh, mamma, you must put on your pretty shawl and your Sunday bonnet!' Here is the portrait; nearly a century has passed over the powder of the pastel, but we see how seriously she played her part. She sits rather stiffly within the rigid folds of her plaid shawl; the perfect order of her coiffure is framed in an impeccable bonnet. At a first glance her features seem rather severe; doubtless the length of the sitting had its effect . . . but if we look a little closer do not her lips appear a little—very willingly—compressed? Can we not detect a desire to smile—a desire suppressed so as not to discourage her boy who is struggling to do his best? I think so, for in the eye glistens a happy light which sees a little artist, silent, grave, absorbed in his work, dominated by the creative effort. . . .

PASTEUR'S MOTHER. (Pasteur del., aged 13.)

PASTEUR'S FATHER. (Pasteur del., aged 16.)

"Three years afterwards Pasteur, on the eve of leaving for the first time for Paris, tried to catch the features of his father. As you will recognize, there is a certain poignant sadness in this portrait: is it produced by the coming separation, or by a secret uneasiness due to the leaning towards an artistic career of a son for whom he dreamt of a more certain destiny—for his ambition was to see his son a future rector of the college of Arbois! Or is it the bitterness of the ex soldier of the Grande Armée who knows the vanity of glory? 'I can still recall,' said Pasteur forty years later, on looking at this portrait—'I can still recall this sadness of my father.' This drawing is not signed. Doubtless it remained unfinished. In my opinion it is the most impressive of Pasteur's drawings—the technique is more assured, and the analysis remains as moving in its keen, observant tenderness."

PORTRAIT OF A NUN, with the Inscription, "Soeur Constance Parpandet, agée de 82 ans." (Pasteur del., aged 18.)

Pasteur went to Paris in November, 1838, but he was miserable there, and his father soon brought him back to Arbois. This was a period of crisis, for the voices of Art and Science were calling him at the same time. It was from this period that most of the drawings shown dated. Dr. Monod called attention to the careful observation and minuteness of the detail in the drawings: "Nothing was missed, neither the embroidery of the mayor's collar, nor a detail of his cross of honour, nor the squint which afflicted him." The last pastel bore the date 1842. It was the portrait of Marcou, who afterwards taught geology at Cambridge, Massachusetts. Durant-Greville, who saw this portrait in America, wrote of it: "Many painters awarded medals at the Salon have never drawn or modelled a mouth with such precision. If Pasteur had wished he could have become someone of standing among painters, and—who knows?—perhaps a very great painter." In the year this portrait was made Pasteur entered the École Normale; he had passed through his crisis; he loved his art with passion, but he saw that his duty lay elsewhere. That was not to say, Dr. Monod insisted, that the artist was dead within him. Throughout his life he was faithful to his interest in painting; he never missed a Salon, and found time frequently to visit great national galleries. At Dresden, for example, his first visit—to the astonishment of his hosts, who awaited him at the laboratories—was devoted to the Museum. Among his intimate friends were many artists, among them the sculptors Paul Dubois and Perrault, the painters Henner and Eberfeldt. But Pasteur drew no more. Dr. Monod had it from a friend who had passed his youth in daily intimacy with Pasteur that he had never suspected the draughtsman in the scientist, so much had scientific research monopolized his spirit. He remained, however, a being in whom the faculties of observation and imagination predominated. He turned first to chemistry; his youthful curiosity drew him to one of the most arid branches of that science, but one in which investigation was carried out solely by the eye—namely, optic chemistry, crystallography. Dr. Monod suggested that his eye was trained for the analysis of crystals by the analytical drawings of his boyhood; he drew the portrait of racemic acid with similar rigorous observation and passionate imagination. "It was necessary to have seen Pasteur at his microscope," wrote Dr. Roux, "to form an idea of the patience with which he examined a preparation; moreover, he examined each object with the same minute care. Nothing escaped his myoptic eye, and we used to say in jest that he saw the microbes growing in the media." The study of racemates bridged the gap between chemistry and biology, and with the study of fermentations began the ascent: investigations of wine; silkworm disease; investigations of beer; virulent diseases; virus vaccines; the prophylaxis of rabies. Link by link the artist built and the experimenter forged the chain of genius. The word "genius" recalled to Dr. Monod the recent estimates of Pasteur at the Academy of Medicine (see JOURNAL, January 6th, 1923, p. 37), and he tried to reconcile the different conceptions of his genius. "Pasteur," he said, "soared above concrete experience. Without imagination the scientist would have stopped at experimental facts. Artist, he swept the infinite with a single cast of his line."

Sir Humphry Rolleston, in moving a vote of thanks to the three lecturers, said that there was one note in the President's address which must have found a response among many in that audience—namely, the President's estimate of the great extent to which Pasteur owed his success to the devotion and self-forgetfulness of his wife. Many of them, although much smaller men than Pasteur, would be more than ready to make the same acknowledgement. The Royal Society of Medicine was to be congratulated on having seized this opportunity of paying a well deserved compliment to Pasteur's genius. It was pleasant to feel that the society had been able to

reciprocate in this way the gracious courtesy of the Academy of Medicine of Paris earlier in the year when that body held a celebration in honour of Edward Jenner. This year would be distinguished by the two celebrations, the centenary of Pasteur's birth and of Jenner's death, and by the fact that both men were honoured in London and in Paris.

Sir StClair Thomson, in seconding, said that in his opening speech the President had rightly remarked that science had no frontiers; but although they welcomed science whether it came from one side of the Channel or the other, or from one side of the Rhine or the other, after all, scientific men had their countries, and it was a great delight to have had placed before them in the address of the President the personality of Pasteur as one of the greatest of Frenchmen. The speaker recalled an occasion when he was motoring through the Savoy in company with a French doctor, and the motor car broke down. They were surrounded by a little crowd of village urchins, and to them his friend put a few questions. Addressing a wee child who was not past the primary in school, he asked her who was the greatest of Frenchmen. "Louis Pasteur," she lisped. He added, "Tell me another great Frenchman—a soldier." "Napoleon," was the answer. "And who was Shakespeare?" "An English poet." The appreciation of great men was a thing to learn from France, and there even the little children were taught that the greatest of Frenchmen was Pasteur.

RESEARCHES ON ANIMAL NUTRITION AT THE ROWETT INSTITUTE.

VITAMINS AND MINERAL SALTS.

THE first report of the Rowett Institute for Research in Animal Nutrition[1] contains a summary of the very important work which has been done at that institute by Dr. Orr and other workers upon many aspects of animal nutrition. The investigations upon the effects upon farm animals of deficiency of vitamins and of minerals are of special interest to the medical profession.

Most people have probably felt that the continual resort to rats, pigeons, and guinea-pigs, as the subjects of experiments upon vitamin deficiency, is rather unsatisfactory, since these few animals form a very narrow basis upon which to frame any general conclusions as to the importance of vitamins in the economy of animals in general and of man in particular. The animals mentioned are of course subjects of choice because they are inexpensive, easy to keep, and happen to show effects of vitamin deficiency relatively quickly. It is, however, very important to remember that the different species of animals vary enormously in their susceptibility to vitamin lack—for example, deprivation of vitamin C kills a guinea-pig from scurvy within a month, but a rat can live indefinitely on such a diet, although it is soon affected by deprivation of either vitamin A or vitamin B.

Cats, dogs, and human beings are moderately susceptible to vitamin lack, but the report of the Rowett Institute shows that farm animals are remarkably resistant to vitamin deficiency. Their results agree on the whole with those of Sir Arnold Theiler, who found in South Africa that cattle, sheep, goats, horses, and pigs were not affected when fed on vitamin deficient diets for periods of from six to twelve months.

Experiments at the Rowett Institute showed that pigs, when fed on a diet deficient in vitamin C for 124 days, grew perfectly normally, and showed no signs of disease. Deficiency in vitamin A produced no ill effects for about 100 days in young pigs, but more prolonged experiments gave results which suggested that deficiency was producing injury. Young pigs were fed on a basal diet of bran and oats with a little blood meal and mineral salts; one group was given cod-liver oil, and another group an equal amount of linseed oil; the second group were therefore on a diet deficient in vitamin A. Both groups grew normally for 120 days; after this period growth in both groups slowed down, but the linseed oil group stopped growing altogether after 150 days, whilst the cod-liver oil group continued to grow slowly. The authors conclude from this and other experiments that cod-liver oil has a definite beneficial effect on the health and rate of growth of pigs, but that the effect is greatest when the animals are on a diet in which the mineral matter is deficient or ill balanced. Experiments upon lambs gave more definite results, for in a period of six months lambs given cod-liver oil increased in weight 66 per cent., whereas control animals in which linseed oil was given instead of cod-liver oil only increased 25 per cent. Experiments at Reading[2] upon pigs showed that pigs deprived of vitamin A grew for about seventy days, but that ultimately growth ceased, and signs of defective nutrition appeared. Experiments at Reading also showed that pigs at a certain stage of vitamin deficiency might grow and appear to be in normal health, and yet might be incapable of producing normal offspring.

These results seem to suggest that young pigs and sheep have very low vitamin requirements, but that they cannot thrive indefinitely when the vitamin A supply is reduced below a certain level.

Dr. Orr, however, points out that the vitamin requirements of farm animals are so low that there is very little likelihood of any animal on an ordinary diet suffering from vitamin deficiency. This conclusion is rather important, for it indicates that it is possible for a cow to continue in perfect health when it is receiving so little vitamins that its milk is practically vitamin free. Such a result might be satisfactory to the cow but would not be beneficial to any infant living on its milk.

The researches upon pigs at the Rowett Institute showed that, while their vitamin requirements were very low, yet on the other hand their requirements of mineral salts were very high. It was found that a young pig which puts on about a pound of weight a day could retain about 5 grams each of lime and of phosphorus daily. Moreover, deprivation of minerals in the food produced signs of malnutrition within thirty days.

Rickets is a common disease in young pigs, and experiments showed that deprivation of a proper supply of mineral salts regularly produced the disease, whereas deprivation of vitamin A did not produce the disease. This last result is, of course, in sharp antagonism to Mellanby's results upon puppies. The report concludes:

> "The results of these experiments seemed to show that, in pigs at least, the chief factor in the production of rickets is the lack of proper amount and balance of the mineral matter of the food, and that the beneficial influence of fat-soluble A and sunlight on mineral metabolism is most marked in cases where the mineral balance of the food is defective. It is probable that rickets in children is to some extent due to the same cause as the disease known as rickets in pigs. The disease usually comes on between the age of six and eighteen months, which is the period when the child is being weaned on to foodstuffs derived largely from cereal grains. These refined products are even more deficient in essential minerals than the grain and offal fed to pigs."

There is general agreement that deficiency of vitamin A, lack of mineral matter in the food, and lack of sunlight, are all factors in the production of rickets in children. The experiments of the Rowett Institute seem to show clearly that in the pig the lack of mineral matter is the dominant factor in producing rickets. This is to be expected since the pig has a low vitamin requirement and its rapid growth imposes a very high mineral requirement. It does not, however, seem safe to assume that the same will be true of human infants, for these grow at only about one-twentieth the rate of pigs, and the available evidence suggests that man is fairly easily affected by vitamin lack.

The differences between the results recorded above and those obtained by Mellanby in dogs suggest that rickets is produced by different causes in different animals, and therefore it is very desirable to have information as to the mode of production of deficiency diseases in as many different species of animals as possible. Metabolism experiments on large animals are of course only possible at institutes which, like the Rowett Institute, are specially equipped for this purpose, and hence work of the kind under review has a very special value.

[1] The First Report of the Rowett Institute, Aberdeen. 1922. Director, Dr. J. B. Orr.

[2] Zilva, Golding, Drummond, and Coward, *Biochem. Journ.*, xv, p. 427, 1922.

THE report of the Inchcape Retrenchment Committee has been published in India, but copies have not yet reached this country. The total saving contemplated appears to be nearly thirteen millions sterling, of which over half is to be obtained by a reduction in military expenditure. It is stated that the Committee proposes to abolish the office of Director of Medical Research and to hand over the duties to the Director of the Kausali Institute, and to abolish also the office of Sanitary Commissioner with the Government of India. Comment must be reserved until the text of the report is received.

British Medical Journal.

SATURDAY, MARCH 10TH, 1923.

THE RECRUDESCENCE OF EPIDEMIC KALA-AZAR IN ASSAM.

KALA-AZAR is little known except by name to the profession in this country, and occurs only sporadically in most parts of India; but it is endemic in Assam, where it occasionally becomes epidemic. It is a very serious disease, characterized by splenic, and often hepatic, enlargement, accompanied by subacute or chronic fever and progressive wasting and anaemia. It is due to infection by *Leishmania donovani*, which lives especially in the endothelial cells of blood vessels and lymphatics, and is particularly numerous in the spleen, the liver, and bone marrow; it, however, occurs also in other organs including the mesenteric lymphatic glands, and in ulcers of the intestinal mucous membrane. After a rapid onset with high fever a chronic condition commonly ensued, and though the patient might survive for months the mortality was very high. Though the parasite has been identified the method of infection is still unknown, but the fact that it can be cultivated into flagellate form indicates that this is part of the life cycle. It is thought possible that it is carried by some biting insect, or that when it is excreted in the faeces and gets into water it may be ingested by some aquatic arthropod in which it passes another stage.

The terrible epidemic of the disease which spread up the Assam valley in the last two decades of the nineteenth century culminated within ten years, but not before it had caused the loss of one-third of the inhabitants and a decrease by two-thirds in the area of cultivated land in the Nowgong district. After being long quiescent the disease became active again in 1917 in the division of Sibsagar in Upper Assam, previously uninfected; in 1919–20, for some unknown reason, an extensive recrudescence took place throughout all the districts previously decimated by the disease. Fortunately, however, the value of segregation in stamping out the disease on tea gardens had in the meantime been demonstrated by Rogers and Dodds Price, and the remarkable curative properties of antimony tartrate, which reduced the mortality from 96 to about 10 per cent., had been established. The Public Health Department, under the energetic Sanitary Commissioner of the Province, Lieut.-Colonel McCombie Young, I.M.S., was therefore able, with the help of liberal grants from the Assam Government, to deal much more effectively than was formerly possible with the threatened devastation of the important tea districts of Sibsagar and Dibrugarh; the results of the measures taken have been recorded by Young in a recent paper read before the Assam Branch of the British Medical Association.[1] With the help of a staff of assistant and subassistant surgeons, special kala-azar hospitals, outdoor dispensaries, and out-centres for detecting early cases have been established through the province. The Sanitary Commissioner himself has superintended the work on the spot throughout the cold weather touring season, and has in many instances been able by his personal influence and action to detect, isolate, and cure the earliest cases in newly affected villages in a way that was formerly impossible, for the onset of the disease is insidious. The striking result has been that of 36 villages where the first case was detected and dealt with, in 28 no further cases occurred in the following year, and that in nearly two-thirds of 66 villages in which the dread disease was discovered before the cases exceeded 5 no cases occurred in the following year; on the other hand, in 14 villages in which 5 cases were found when the disease was first discovered only one was free in the following year, and in nine of the remaining thirteen the new cases in the next year numbered from 11 to 30. These facts show clearly that, unless the first few cases are detected by an efficient organization, serious loss of life and not rarely decimation of the village will ensue and great expense will be incurred in segregating the people of the new severely infected villages. The success of the hospitals and dispensaries has been remarkable; during 1920 and 1921 over 32,000 cases have been treated with prolonged courses of antimony tartrate given by intravenous injections. It is estimated that in this way a direct saving of 23,000 lives has been effected, and that, in addition, a much larger number of new infections has been indirectly prevented; this is a wonderful record in a country so medically backward. By this policy it has so far been just possible to keep the renewed epidemic in hand, but the danger is still far from being over.

In the face of these facts it hardly seems credible that the Assam Government should have suggested as a measure of economy the abolition of the post of Sanitary Commissioner of the Province, and that all the work of that officer should be handed over to the already overburdened civil surgeons, who cannot possibly spare the time necessary for the prolonged touring involved in carrying out the kala-azar preventive work of the Public Health Department. The proposal has, however, recently been made.[2] We strongly protest against a policy so penny wise and pound foolish. Anyone personally acquainted with the conditions during the epidemic in the Nowgong district thirty years ago is aware that the result must be untold suffering and loss of life, as well as eventual decrease of land revenue many times as great as the proposed immediate economy; the suggestion could only have been made because the generation of officials has passed away who had experience of the appalling epidemic of three decades ago, when the dead remained unburied, calling to mind the horrors of Russia of to-day.

LUNACY LAW AND THE TREATMENT OF THE INSANE.

DR. J. R. LORD, medical superintendent of Horton Mental Hospital, has recently drawn attention to some of the defects in English lunacy law. He shows that while the Lunacy Act of 1890 was most carefully and conscientiously framed from the local point of view as a measure designed to secure the best treatment of the mentally unsound, it is extremely incomplete. It portrays almost entirely the legal attitude of mind to the insane. The "patient" it deals with means every person received or detained as a lunatic or taken charge or care of as a lunatic; he is not a "patient" in the medical sense. It is not the onset of disease which makes him a "patient" but an act under the law. It is not the cessation of disease which occasions him ceasing to be a "patient" but the failure to find sufficient cause for detention. To the medical view of insanity a secondary importance is assigned, and respect for the liberty of the subject is accounted of more importance than that those who are afflicted with mental disease should have every opportunity of obtaining the best treatment at the earliest possible moment, and under the most favourable circumstances for their recovery. In effect, the attitude the law takes to a person suffering from mental disease is that he shall not enter an asylum for treatment unless circumstances force it, nor shall he remain there if it is

[1] See page 79 of this week's SUPPLEMENT.

[2] *Indian Medical Gazette*, February, 1923, p. 76.

possible for him to be outside. Nowhere, Dr. Lord goes on to point out, does the law urge upon citizens the duty of taking prompt steps for the proper treatment of the mentally afflicted; on the contrary, it treats such steps with suspicion and imposes restrictions, with the result that those primarily concerned avoid invoking the law's aid. Dr. Lord considers that the lunacy law wants "completing," as it were, at both ends, in order to cover more appropriately and effectively the early stages of mental disease and the convalescent period. He suggests also that much of it needs recasting to bring it more into accord with the spirit of the time.

A number of factors thus act as barriers to the adequate treatment of the psychoses in their early and more curable stages. The irksome legal restrictions, the abnormal attitude of the patient, the resistances of the relatives, and the reluctance of the doctor—all combine to prevent early and effective treatment. In no form of illness is hospital treatment and removal from the home environment more desirable in the interests of all concerned than in mental disorder; and yet such measures are usually only undertaken when the conduct of the patient renders them imperative. It has to be admitted that there is undoubtedly a "stigma" attached to an ex-mental hospital patient, and the relatives are placed in a very difficult position when the question of certification arises. If treatment in mental hospital be avoided the condition of the sufferer may become hopeless; by adopting it, a life may be partially wrecked. It is this "stigma" which, in Dr. Lord's opinion, constitutes the real difficulty, and he suggests that only a bold attempt to teach the rising generation better ideas regarding insanity will remove it. He advocates the inclusion of a course of mental and physical hygiene in the educational code schools, and considers that if more enlightened notions were to prevail generally among the community most of the troubles regarding the treatment of mental diseases would disappear. It would not matter where a patient were treated or what the institution was called so long as the most effective treatment was secured. Very little is to be said in favour of home treatment, especially in the case of the poor. Home treatment would, in fact, never be dreamt of had people confidence in mental hospitals; the main problem is to discover how such confidence can be gained.

Towards the solution of this problem Dr. Lord makes a number of useful and practical suggestions. He urges that mental hospitals should, as far as practicable, be thrown open in the same spirit as are general hospitals; that they should be part and parcel of the everyday life of the community, and not an excrescence hidden away from the public eye; that social visitors should be appointed; that asylums should be free to experiment, expand, evolve, and progress with the general advancement of medicine like general hospitals; that out-of-date institutions should be abolished and replaced by smaller mental hospitals of modern type; and that there should be better provision in all mental hospitals, preferably in detached buildings, for the treatment of voluntary boarders and incipient insanity—to permit this the law must be altered.

A STATISTICAL STUDY OF SUICIDE.

THE second number of the Monographic Series issued by the *American Journal of Hygiene* is a thorough study of the statistics of suicide by Dr. John Rice Miner of the Department of Biometry and Vital Statistics in Johns Hopkins University.[1]

In the first section of the monograph international comparisons of rates of suicide are made; particular attention is devoted to seasonal distribution. In all the European countries (except Switzerland, 1889–1893) the maximum rate is in May or June. There is no obvious connexion with geographical latitude; the statistics of Japan for 1888–1892 show a maximum in May, but a nearly equal incidence in July; for the period 1896–1905 the relations are reversed, the July peak is the taller. In New York City, 1871–1912, the maximum rate was in May. The distribution of suicides by days of the week is shown for Prussia and for the United States. We are a little suspicious of these data. Thus, while in 1907 Prussian female self-destroyers showed a distinct preference for Thursday as the fatal day, no such peculiarity is found in the data of 1908. Dr. Miner suggests that the distributions are probably based upon too few cases to be significant. The total number for both sexes and the two years is 15,133, but the greater proportional frequency of suicide in men may result in the numbers becoming really small for the female experience. In the United States both men and women prefer to kill themselves on Sunday or Monday, particularly Monday. Dr. Miner remarks that "it is conceivable that the greater proportion of suicides on Sunday in the United States than in Europe may be due to the lesser opportunities for Sunday recreation in the former"; it is certainly conceivable—it is also conceivable that the author is experimenting in the ironical. Dr. Miner then confronts the statistics of suicide ordered by the religious confession of the victims. "In the various cases," he writes, "we see exemplified the same law: the conservative and authoritarian cults show lower suicide rates than the liberal denominations. We find this even among the various divisions of Protestantism, where, as in Hungary, they are given separately; the Evangelical church shows a lower rate than the Reformed or the Unitarian. The rapid increase in the Jewish rate accompanies a decay of the influence of orthodox Judaism. These are all further examples of the effect of the group spirit on suicide which we have already seen in the increase of the suicide rate during the nineteenth century and in its decrease during wars." Dr. Miner then deals with sex, age, and occupation. In the tabulation of Ogle, which, however, relates to forty years ago, medical practitioners suffered a very high rate of suicide, being exceeded only by soldiers and those connected with the supply or sale of alcoholic drinks. As might be expected, the choice of means of self-destruction is dependent upon opportunity. Thirty-five per cent. of suicides in the army (Ogle's data) were by gunshot; 60 per cent. of suicides amongst medical men were by poison, 86 per cent. of suicides amongst chemists and 85 per cent. amongst photographers were by the same means.

The second half of Dr. Miner's monograph is devoted to a very careful analysis, with the help of the method of correlation, of the relation between the suicide rate and a number of climatic and demographic factors in cities of over 25,000 inhabitants within the United States Registration Area in the years 1909–11. He reaches the following conclusions: "The net correlations of suicide with mean per cent. of sunshine, altitude, mean temperature, industrialization, and number of negroes are not significant; those with precipitation, age, density, and general mortality are low, but possibly significant, high suicide rates being associated with low precipitation, density and general mortality, and high mean age. The correlation of suicide with proportion of males is 0.41 ± 0.04." He states also that "the fundamental factors underlying differences in suicide rates are probably (1) difference in strength of the group spirit, (2) adverse economic changes, (3) racial factors, (4) health of population." A full bibliography is appended, making the monograph as complete a study of a depressing but important subject as we are likely to see.

[1] *Suicide and its Relations to Climatic and other Factors.* By John Rice Miner, Ph.D. Baltimore: *American Journal of Hygiene.* 1922. (Sup. roy. 8vo, pp. 140.)

THE OLD ENGLISH HERBALS.

HE must be a very hard man in whom the word "garden" does not awaken some pleasant memory. Bacon was not tender-hearted, but he wrote: "God Almightie first planted a Garden. And indeed, it is the Purest of Humane pleasures. It is the Greatest Refreshment to the Spirits of Man; Without which, Buildings and Palaces are but Grosse Handy-works." The veriest Cockney, to whom most of the herbs in Miss Rohde's book[1] are nothing but names, may read with pleasure that "Violet is a lytyll herbe in substaunce and is better fresshe and newe than whan it is olde. And the floure thereof smellyth moost.... And the more vertuous the floure thereof is, ye more it bendyth the heed thereof dounwarde. Also floures of spryngynge tyme spryngeth fyrste and sheweth somer. The lytylnes thereof in substaunce is nobly rewarded in gretnesse of sauour and of vertue" (a fourteenth-century translation of Bartholomew). Master Gerard's garden in Fetter Lane is gone; none may lease a garden (two acres) east of Somerset House for four pence a year, nor gather the yellow-flowered figwort "in the moist medowes as you go from London to Hornsey"; but violets may still be had—in bunches and not very "fresshe and newe"—within the Bills of Mortality. Miss Rohde has traced the story of our English Herbals from Anglo-Saxon times to the eighteenth century, from the Leech-Book of Bald to the work of John Archer (1673). She is not a "superior" person, but that much more gracious being, a scholar. "Many of us," she writes, "miss all that is most worth learning in old books through regarding anything in them that is unfamiliar as merely quaint, if not ridiculous. This attitude seals a book as effectually and as permanently as it seals a sensitive human being. There is only one way of understanding these old writers, and that is to forget ourselves entirely and to try to look at the world of nature as they did. It is not 'much learning' that is required, but sympathy and imagination." So she is able, with the help of the old books, to conjure up a picture of the days when both men and beasts were often elf-shot and and one fashioned a salve for flying venom from a "handful of hammer wort and a handful of maythe (camomile) and a handful of waybroad (plantain) and roots of water dock." We have more modern defences against "the on-flying things," but not—in the case, let us say, of an influenza—always more efficacious. But we do not know that the picture is an attractive one; we are rather of the mind of Johnson in his rejoinder to Monboddo. Our imagination is haunted, not by the romantic beauty of those days, but by the sense of fear which, as R. L. Stevenson said, is master of the primitive mind.[2] "Go on Thursday evening when the sun is set where thou knowest that helenium stands, then sing the Benedicite and Pater Noster and a litany and stick thy knife into the wort, make it stick fast and go away; go again when day and night just divide; at the same period go first to church and cross thyself and commend thyself to God; then go in silence and, though anything so ever of an awful sort of man meet thee, say not thou to him any word ere thou come to the wort which on the evening before thou markedst; then sing the Benedicite and the Pater Noster and a litany, delve up the wort, let the knife stick in it; go again as quickly as thou art able to church and let it lie under the altar with the knife; let it lie till the sun be up, wash it afterwards, and make it into a drink with bishopwort and litchen off a crucifix; boil it in milk thrice, thrice pour holy water upon it and sing over it the Pater Noster, the Credo, and the Gloria in Excelsis Deo, and sing upon it a litany and score with a sword round about it on three sides a cross, and then after that let the man drink the wort; soon it will be well with him." We should justly incur Miss Rohde's censure were we to call this prescription either quaint or ridiculous; rather is it an illustration of the gloom and dread by which the minds of the people of those days were haunted. Miss Rohde says, truly enough, "suburban life has separated the great concentrated masses of our people from their birthright of meadows, fields, and woods; of Nature, in her untamed splendour and mystery, most of them have never had so much as a momentary glimpse." But with that untamed splendour has gone a heavy burden of fear. As Miss Rohde brings us nearer to modern times there is more beauty and less horror in the lore of plants, and she explains why Gerard's *Herball* has secured an immortality denied to other and intrinsically better books. It is the same reason which keeps Isaac Walton's memory green. Gerard could write. We may conclude our notice of Miss Rohde's pleasant book with a short proof that Gerard could write: "The Plant of Roses, though it be a shrub full of prickes, yet it hath beene more fit and convenient to have placed it with the most glorious flowers of the world than to inserte the same here among base and thornie shrubs; for the rose doth deserve the chiefest and most principall place among all flowers whatsoever, being not only esteemed in his beautie, vertue, and his fragrance and odoriferous smell, but also because it is the honor and ornament of our English Scepter, as by the conjunction appeereth in the uniting of those two most royal houses of Lancaster and Yorke. Which pleasant flowers deserve the chiefest place in crowns and garlands."

[1] *The Old English Herbals.* By Eleanour Sinclair Rohde. London: Longmans, Green, and Co. 1922. (Cr. 4to, pp. xi + 243; illustrated. 21s. net.)

[2] "For it is scarce possible to exaggerate the extent and empire of his superstitions: they mould his life, they colour his thinking; and when he does not speak to me of ghosts, and gods, and devils, he is playing the dissembler and talking only with his lips." (*In the South Seas*, Part II, Chapter VI.)

VITAL STATISTICS OF HOLLAND IN 1920.

THE *Statistiek van de Sterfte over het Jaar 1920* of the new series of *Bijdragen tot de Statistiek van Nederland* may be compared with our own vital statistics, although, owing to differences of age grouping, this is not always easy. The census population of Holland in 1920 was 3,410,262 males and 3,455,052 females. The proportion of females to 1,000 males was 1,013. In the census population of England and Wales, 1921, the proportion was 1,095. Holland was not a belligerent country, and the constitution of her population in 1920 was not unlike that of England and Wales before the war, and somewhat more favourable to low rates of mortality than ours, as it included a larger proportion of males of military age. The crude death rates were 12.09 for males and 11.66 for females; in 1913 the rates were 12.61 and 12.01. The corresponding rates for England and Wales were 13.4 and 11.5 in 1920, and in 1913 14.7 and 12.8. The infant mortality in the first year of life per 1,000 live births has fallen from 104.3 in 1909–13 to 72.8 in 1920. The mortality in England and Wales fell from 108 in 1913 to 80 in 1920. The difference between the rates in the provinces was very great. For instance, the rate for Noordbrabant in 1920 was 112.6, in Friesland 49.4, and in Noordholland 52.7. Holland has notifications of stillbirths and the vital statistics of infancy are elaborately tabulated. The per mille ratio of stillbirths to all births has not varied substantially since 1910 (37.6 in 1910–19 and 37.4 in 1920). A great contrast is shown in the deaths from infectious diseases in the two countries. England and Wales is only superior to Holland in its death rate from typhoid. In 1920 the crude rate for Holland was 4.6 per 100,000, and the rate for England and Wales only 1.4. On the other hand, the Dutch figures for diphtheria and croup were 7.37, less than half the England and Wales rate of 15. Fifty years ago, 1870–74, the death rate from diphtheria and croup in Holland was 41.14, and the rate for England and Wales 30.5 (1871–75). In the quinquennium 1895–99 the Dutch figure dropped from 33.52 in the previous quinquennium to 17.01, and has remained below that figure up to 1920. The English figures in 1891–95 were 32.3 and in 1895–1900 30.7. Scarlet fever mortality in Holland was 1.84 in 1920 and 5.39 in 1919. The corresponding figures for England and Wales were 3.8 and 3.3. The death rate from measles in Holland was 9.21 in 1920 and 19.1 in England and Wales. The rates of mortality for all forms of pneumonia were 14.03 per 10,000 males and 12.12 for females, and in England and Wales 12.06 and 7.78. The death rates from tuberculosis show a very

high mortality for women, 11.84 per 10,000 females against 10.02 for males. In 1901–05 the male rate was higher than the female—13.77 and 13.31. The crude rates for England and Wales in 1920 were 10.15 males and 7.75 females. Comparing the female death rates at ages in the two countries, the rates of Holland are in excess of the English rates at every age group, and especially at the early and later ages. If the rates of Holland are expressed as a percentage of the English rates, at all ages over 50, the Dutch women die from tuberculosis at 205 per cent. of the rate for the English women, and 272 per cent. at ages under 1 year. The mortality rate from all forms of cancer was 11.26, almost identical with that of England and Wales, 11.61. In one province only, Limburg, has the rate diminished over the past twenty years. The report suggests that this may be due to the fact that the mining industry has greatly developed there and the constitution of the population by age has become unfavourable to high cancer rates. The most striking feature of the site rates is the more favourable position of Dutch women regarding cancer of the female genital organs and breast, and the higher mortality in Holland ascribed to cancer of the stomach and liver. Roughly speaking, the Dutch rate for the two former sites is little more than half of that of England and Wales, and for the group including stomach and liver more than 60 per cent. higher.

BENVENUTO CELLINI.

In a recent essay on Benvenuto Cellini's diseases and doctors Professor A. Castiglioni[1] remarks that among the biographical documents handed down to us from the sixteenth century none possesses the freshness, spontaneity, and fascination of Cellini's autobiography, which, strange to say, has received more attention from foreigners, such as Goethe, Dumas, and Symonds, than from his fellow countrymen. Like Casanova in his *Memoirs*,[2] which give a vivid picture of social life two centuries later, including much of interest to the medical reader, Cellini describes his illnesses, which included malaria and syphilis, and an account of contemporary medical men and quacks not unfrequently accompanied by scathing criticism of their methods of treatment. Both writers were boastful, unscrupulous, and almost if not entirely destitute of moral sense, but both preserved their mental and physical powers until the end. Cellini's first illness was a malarial infection which he contracted in 1517 at the age of 17 in Pisa, where prior to the extensive hygienic improvements carried out by Cosimo I malaria was rampant. He had a second attack at Mantua in 1528, a more severe one in 1535 at Rome, where he was attended by Francesco da Norcia, one of the most distinguished physicians of the time, and a fourth attack during the casting of the celebrated Perseus statue. During the epidemic of plague in 1524 Cellini was at Rome, where he made the acquaintance of the celebrated anatomist and surgeon Berengario da Carpi, to whom he sold some of his vases. The illness which Cellini contracted at this time was probably not, as he imagined, an attack of plague, but a simple cellulitis of the arm with lymphadenitis due to septic infection of the hand. At the age of 32 Cellini contracted syphilis at a time when the disease was almost endemic. Although no mention is made of a primary lesion, the history of exposure to infection, the occurrence of an eruption and an inflammation of the eyes (specific iritis), which interfered with his professional activities, leave no doubt as to the nature of the affection. He promptly submitted to two courses of treatment—by guaiacum, then known as "lignum," "sanctum lignum," "spes hominum," "gloria novi mundi," which had recently been introduced from America, where the Spaniards had observed that decoction of guaiacum was used for treating various ulcerative diseases of the skin. "Probably no remedy in the history of medicine," says Professor Castiglioni, "has enjoyed a wider, more rapid, and undisputed success." Its efficacy in Cellini's case is shown by the fact that there is no subsequent mention in the autobiography of any symptoms suggestive of further syphilitic or parasyphilitic manifestations. During his stay in Paris in 1537 Cellini became a firm friend of the celebrated anatomist Guido Guidi, who has given his name to the Vidian artery and nerve, and was at that time court physician to François I. The privations which Cellini underwent during his prolonged imprisonment in Rome in 1538 and 1539 do not appear to have had a permanently injurious effect upon him any more than the imprisonment in the "Leads" at Venice did on Casanova, although he was suffering from a broken leg caused by an attempt at escape, and was living in deplorably insanitary surroundings. An attempt to poison him during his imprisonment by one of his enemies, who mixed powdered jewels in his food, was discovered in time, but a subsequent attempt with sublimate ten years later was more successful; he did not completely recover from the effects for over a year. According to Professor Castiglioni, the charges of homosexuality and sexual perversion which were also brought against his contemporaries Michael Angelo and Sodoma do not rest upon a sure foundation, nor can his frequent quarrels with his fellow artists and others be regarded as evidence that he was suffering from delusions of persecution. The story of his life as told in the autobiography stops abruptly in the year 1562, but he survived another nine years, dying of angina pectoris at the age of 71, in full possession of his faculties. The translation into English by J. A. Symonds, first published in 1887, has truly been called masterly; it is a fascinating book.

[1] *Bollettino dell' Instituto Storico Italiano dell' arte Sanitaria*. November–December, 1922, p. 281.

[2] J. D. Rolleston in *Janus*, 1917, xxii, p. 115.

MILK UNDER SPECIAL DESIGNATIONS.

For several years past milk has been sold as "graded" and "certified" under the provisions of Orders made by the Food Controller and later by the Minister of Health. Since January 1st of this year the sale of milk under these and other designations has been regulated by the Milk and Dairies (Amendment) Act, 1922, and by Orders made by the Minister of Health under that Act. Milk may now be sold under four special designations—namely, "certified," "Grade A (tuberculin tested)," "Grade A," and "pasteurized." In a memorandum issued by the Ministry of Health for the information of those specially concerned particulars are given of the conditions under which these designations may be used and the steps which must be taken to secure authority for their use. The producer of certified milk must obtain a licence from the Minister of Health, for which he has to pay an annual fee of £5. Those who deal in this milk must obtain a licence costing five shillings from the local authority in whose area their trade is carried on. The herd must be tested by tuberculin prior to the granting of the licence and subsequently every six months, and must be examined every three months by a veterinary surgeon nominated by the Minister. The milk must be bottled on the farm immediately after production. The cap of the bottle must form a seal and must bear the address of the producing farm and the day of the week on which it was produced, together with the words "certified milk." At any time before delivery to the consumer the milk must not contain *Bacillus coli* in one-tenth of a cubic centimetre or more than 30,000 bacteria per cubic centimetre. It must not be pasteurized. The regulations with respect to Grade A (tuberculin tested) milk are similar to those for certified milk as regards the testing of the herds and prohibition of pasteurization, and the licensing authority for the producer is again the Minister of Health. Otherwise the production and distribution of tuberculin tested milk is governed by the regulations for Grade A milk. For Grade A milk the council of the county or county borough grants the licence at a fee of one guinea in respect of the farm and two guineas in respect of the bottling establishment, whether at the farm or elsewhere. The distributor is licensed by the local authority, the fee being five shillings. The herd must be examined every three months by a veterinary surgeon nominated by the licensing authority. If the milk is pasteurized the fact must be stated on the cover

of the containing vessel; the milk must not contain *B. coli* in one-hundredth of a cubic centimetre or more than 200,000 bacteria per cubic centimetre. The milk must be dispatched from the farm in an unventilated sealed container on which is placed the address of the farm, the day of production, whether produced morning or evening, and the words "Grade A milk." For pasteurized milk a local authority grants the licence for a fee of one guinea in respect of each pasteurizing plant, and of five shillings with respect to each establishment at which such milk is sold. Pasteurizing must not be carried out more than once. The containers must be labelled with the date of pasteurization and with the words "pasteurized milk." After pasteurization there must not be in the milk *B. coli* in one-tenth of a cubic centimetre or more than 30,000 bacteria per cubic centimetre, subject to the provision that, until January 1st, 1924, no test for *B. coli* will be imposed, and the maximum bacterial content may reach 50,000 per cubic centimetre. In an address which Dr. John Robertson, the medical officer of health for Birmingham, recently delivered before a sessional meeting of the Royal Sanitary Institute in Birmingham he stated that average milk when it reached Birmingham contained over 2,000,000 bacteria per cubic centimetre, which meant that it had been milked under more or less dirty conditions, that it had not been properly cooled, and that it had been delayed for a considerable time on its journey to the city. He considered that the cost of producing certified or graded milk was practically prohibitive to the ordinary consumer, but recommended pasteurization on a uniform basis, the pasteurization being controlled. He urged that farmers and dairymen must recognize as essential to the production of clean milk that every article in which milk is received, from the farmer's milking cans to the railway churns and bottles, should not only be cleaned, but subsequently sterilized by steam.

SMALL-POX PREVALENCE.

FROM the returns of the Registrar-General it appears that in the first eight weeks of the year—from December 31st to February 24th—305 cases of small-pox were notified in England and Wales outside London. In the successive weeks the numbers were 12, 48, 46, 48, 37, 27, 41, and 46. The counties chiefly affected have been Derby with 115 cases, the West Riding of Yorkshire 82, the North Riding 43, Notts 39, and Durham 11. Cases have occurred also in the counties of Stafford, Lancaster, Lincoln, Hertford, Hereford, and the Soke of Peterborough. Included in these figures are the towns of Doncaster (60 cases), Middlesbrough (42), Nottingham (12), and Ilkeston (10). The other districts with the largest numbers of attacks are in Derbyshire—Heanor having had 59 cases and Clown 34. At Basford in Notts there have been 15 notifications. The disease appears to be of a mild type. Fortunately the outbreak of a very severe strain of small-pox which attacked the inmates of Poplar Workhouse was stamped out in its limited and well defined area by the concentrated efforts of the several authorities concerned. It has been said that in some parts of America an exceedingly mild type of small-pox has become practically endemic, no doubt owing to its being so lightly regarded in respect of the calling in of medical aid, and of notification, vaccination, isolation, surveillance of contacts, and so forth. What the present position in America is we cannot say, but great vigilance may be required to prevent endemicity of the infection in Britain; and it must never be forgotten that though mild small-pox often breeds true, that is not always the case, and virulence may develop as an outbreak proceeds. It is locally reported that at Clown, where seven more cases have been notified two or three days ago, the disease is taking on an increasingly virulent character. It would be the falsest of false economy if the staff of the Ministry of Health were so starved of personnel as to be unable to give the country the fullest benefit of the unsurpassed knowledge of its medical department in the investigation and control of small-pox. It is said that the disease has appeared in Aberdeen, where the last case occurred in 1918.

VISIT OF FOREIGN HEALTH OFFICERS.

THE foreign health officers now visiting England and Scotland to study methods of health administration, under the auspices of the Health Organization of the League of Nations, left for the provinces after a strenuous week in London. The party, numbering twenty-nine, is drawn from fourteen European countries, from the United States, and from Japan. By request of the Ministry of Health the arrangements were made by Society of Medical Officers of Health, and it was at the house of the Society that the visitors were welcomed on their arrival by Dr. W. J. Howarth (chairman) and the other members of the reception committee. The occasion offered an informal opportunity for guests and hosts to become known to one another, and Sir George Newman, in a speech of greeting, indicated the great benefits that might be expected to result from the comparative study of methods of health administration in various countries. On the following day (February 26th) the visitors were officially welcomed at the Ministry of Health by the Earl of Onslow, Parliamentary Secretary to the Ministry, and Captain Walter Elliot, M.P., Under Secretary for Health for Scotland. Sir George Newman gave an illuminating address on the whole system of public health administration in England and Wales. In the afternoon and on the following morning explanatory lectures on the various activities of the Ministry were delivered by Lieut.-Colonel S. P. James, Dr. Barbara Cunningham, Dr. F. J. H. Coutts, and Dr. J. Smith Whitaker, so that the visitors started their tour with a good insight into the scheme of central administration. On Tuesday afternoon a visit was paid to the Royal Army Medical College, where the guests were received by the Director-General (Lieut.-General Sir John Goodwin) and the Commandant of the College (Colonel C. B. Martin). An address on "The present-day trend of military hygiene," by Major N. V. Lothian, was followed by a series of demonstrations in the laboratories by the staff of the College. Later the visitors were entertained at tea at the R.A.M.C. Mess, where they had an opportunity of talking with Sir William Leishman, Sir William Macpherson, and a number of civilian guests who had been invited to meet them. The whole of March 1st was spent with the Registrar-General and his staff examining the statistical methods at Somerset House and the compilation of the Census returns. The following day was occupied to great advantage in visiting institutions of the Metropolitan Asylums Board. The system for the collection of fever cases and their allocation to the most convenient hospitals was explained during a visit to a typical ambulance station. An inspection of the Brook Fever Hospital at Shooter's Hill under the guidance of Dr. J. B. Byles was followed by a visit to Queen Mary's Hospital at Carshalton, where Dr. W. T. Gordon Pugh explained the methods of orthopaedic treatment, which greatly interested the foreign delegates. On their way back to London the party were shown round the Tooting Bec Mental Hospital by Dr. E. H. Beresford, and the day closed with a comprehensive account of all the Board's undertakings by the clerk, Mr. G. A. Powell, C.B.E., whose lecture was illustrated by lantern slides. The party was much impressed by the magnitude of the Board's work. On March 2nd it was the turn of the Metropolitan Water Board; after a formal reception by the vice-chairman and other members of the Board, Sir Alexander Houston gave a lantern lecture on the work of his laboratories in connexion with water examinations, and then accompanied the party to the reservoirs, filters, and chlorinating plant at Hampton. The final fixture of the week enabled the party to see something of the housing schemes of the London County Council. Escorted by Lieut.-Colonel C. B. Levita (chairman of the Housing Committee), Dr. William Butler, Mr. David Edwards, and other officials of the Council, they were shown the clearance scheme in the Tabard Street area and the new houses at Roehampton. Throughout the week the visitors have been greatly interested in the programme arranged for them, and in every case they have been supplied with reports and other documents which will enable them to

understand the full significance of what they have seen. Although the visit is not intended to be of a festive nature the guests have enjoyed some pleasant hospitality during the week. On Monday the Royal Sanitary Institute held a reception in their honour, which was attended by the diplomatic representatives of most of the countries that have sent delegates; on Wednesday the whole party attended the Pasteur celebration at the Royal Society of Medicine. In groups of four or five they are now pursuing their course of study at Glasgow, Newcastle-on-Tyne, Liverpool, Manchester, Bradford, and Birmingham, until they return for a second week in London after Easter.

THE MEDICAL AND DENTAL REGISTERS.

THE *Medical Register* for 1923 has been issued.[1] From a table prefixed to the list it appears that it contains 46,477 names; of this number 22,713 (48.88 per cent.) are shown as registered in England, 14,605 (31.42 per cent.) in Scotland, and 6,814 (14.66 per cent.) in Ireland. There are 2,239 (4.81 per cent.) on the colonial list, and 106 (0.23 per cent.) on the foreign list. The names newly registered in 1922 numbered 1,984—a larger number than in any previous year, and exceeding the number registered in 1921 by 224. The number of names removed was 1,045; of these, 725 were removed on evidence of death and 311 under Clause XIV of the Medical Act of 1855, which requires the Council to erase from the *Medical Register* the name of any person who failed to reply to an inquiry addressed to him by the Registrar as to whether he has ceased to practise or has changed his address. The volume contains also the warning notices issued by the General Medical Council and by the Dental Board of the United Kingdom. The latter appear also in the *Dentists Register* for 1923, together with the regulations of the Dental Board. Owing to the operation of the Dentists Act, 1921, the number of names on the *Dentists Register* has been more than doubled; the number in the issue for 1922 was 5,831, the number in the issue for 1923 is 12,762. The number added by registration since the last issue is 7,603, and of these only 334 were registered with qualifications. Altogether 712 names were removed; of these 7 were removed for failure to reply to an inquiry, and 636 owing to failure to pay the required fee. The number of dentists with a colonial diploma has risen from 5 to 10, and those with a foreign diploma from 3 to 6. The General Medical Council has also issued a volume containing lists of medical and dental students registered during the year 1922; the total number of medical students so registered was 1,833 and of dental students 424.

BRITISH CONGRESS OF OBSTETRICS AND GYNAECOLOGY.

THE fourth Annual British Congress of Obstetrics and Gynaecology will be held in Edinburgh on April 19th and 20th, with a possible extension to the 21st. The gathering is really a conjoint meeting of the various obstetrical and gynaecological societies in the United Kingdom and Ireland—namely, the Royal Society of Medicine (Section of Obstetrics and Gynaecology), the Edinburgh Obstetrical Society, the Glasgow Obstetrical and Gynaecological Society, the Midland Obstetrical and Gynaecological Society, the Royal Academy of Medicine in Ireland (Obstetrical Section), the Ulster Medical Society, and the North of England Obstetrical and Gynaecological Society. On this occasion the Edinburgh Obstetrical Society hopes to welcome a large number of representatives from the other societies. The Royal College of Surgeons has kindly granted the use of its hall for the discussions, and the Royal College of Physicians is allowing the use of its hall for a dinner which will be held on the evening of April 19th. The main discussion on the first day of the Congress will be upon intrinsic dysmenorrhoea, regarding the main features of which a report embracing information and statistics from different parts of the country will be presented. Opportunity will also be afforded for a number of short papers on other subjects, and for the exhibition of specimens of special interest. The secretaries of the Edinburgh Society, Dr. H. S. Davidson, 52, Melville Street, and Dr. James Young, 29, Manor Place, will be glad to receive notice of such papers or specimens as soon as possible. Those who intend to be present are also requested to inform the secretaries either directly or through the secretary of their own society.

[1] London: Published for the General Medical Council by Constable and Co., Ltd.

NORTH PERSIAN FORCES MEMORIAL MEDAL.

WE have been asked by the War Office to announce the institution of a Memorial Trust Fund, commemorative of the services of the late North Persian Forces, which has been subscribed by officers of the Royal Army Medical Corps and Indian Medical Service who served with these Forces. In accordance with the desire of the subscribers to encourage the study of tropical medicine and tropical hygiene it has been decided that the Memorial should take the form of a silver medal, to be known as the "North Persian Forces Memorial Medal," to be awarded annually for the best paper on tropical medicine or tropical hygiene published in any journal during the twelve months ending December 31st by any medical officer, of under twelve years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service. The first award will be for the best paper published during the twelve months preceding December 31st, 1923. The award will be announced in the latter part of the year following that in which the paper was published, provided that the Memorial Committee considers the papers published to have attained a standard of merit justifying an award.

SIR RICHARD HAVELOCK CHARLES, Medical Adviser to the India Office and President of the Medical Board, will shortly attain the age limit, but, owing to the exigencies of the service, his retirement is for the present postponed. Statements which have been published with regard to his successor are entirely devoid of foundation.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Dangerous Drugs and Poisons (Amendment) Bill.

THE Home Secretary (Mr. Bridgeman) moved the second reading of the above-named bill on February 28th. He said that at present any constable could enter the premises of any person carrying on the business of a producer, manufacturer, seller, or distributor of drugs and inspect his books. That was inadequate, for while search could be made only of the premises of known dealers in these articles those who carried on the trade secretly were missed. Accordingly powers were asked to search the premises, persons, and papers of any person suspected of being in illicit possession of drugs. The second clause was intended to bring within the penal provisions of the bill acts done in this country with a view to illicit transactions abroad. Enormous profits were made by this trade. In a recent instance it was believed that someone got as much as 2,400 oz. of morphine and 2,500 oz. of cocaine, which represented several million doses. For such an offence a fine of £200 was far from adequate. France had already set the example of increasing penalties, and the Council of the Assembly of the League of Nations recommended the Governments concerned to consider the question of more substantial sentences of imprisonment. Therefore it was proposed to substitute for the existing penalties a maximum of ten years' penal servitude, or a fine of £1,000, or both, in cases of conviction on indictment, and, secondly, a maximum penalty of twelve months' imprisonment, or a fine of £250, or both, in cases tried summarily, and it was proposed to do away with the provision for increasing the penalty for a second offence. In Clause 3 were provisions to meet the difficulty which the Pharmaceutical Society had brought to the notice of the Home Office in regard to the supply of drugs to duly qualified medical practitioners. Under the Pharmacy Act, 1868, there was a "poison book" which everyone was expected to sign on buying these drugs at a chemist's shop, but in practice it was impossible to observe the provision, and he thought it had been largely allowed to fall into disuse.

What the Ministry wished to do was to get it made quite clear that the drugs ordered were required by a medical practitioner, and to safeguard the transit between the shop and the practitioner as much as practicable. The seller would have to enter in a book the words "signed order," instead of requiring the doctor to sign. If the article was sent by post it must be sent by registered post, and it must not be sold to anyone except a registered medical practitioner in actual practice. It was quite possible that some of the medical profession might wish to have some slight modification of the clause, and this he would be very ready to consider.

Sir Frederick Banbury thought the bill would require amendment in Committee. He referred especially to the possibility that where a man had a letter or document in his house which indirectly might relate to the selling of cocaine by some other person, a penalty of £1,000 or ten years' penal servitude or both might be imposed.

Dr. L. G. S. Molloy said that certain parts of the bill as framed would bear very hardly upon medical men. He hoped that provision would be made in Committee for limiting the penalty when a medical man was guilty of a purely technical offence only. Another great objection to the bill as it stood was that under it a medical man would not be able to obtain urgently needed drugs by asking for them over the telephone. A further objection which he thought carried more or less a slur upon the profession was that a doctor might not prescribe drugs for himself, not necessarily for his own consumption, but for his own use in his practice, without going through all the technical arrangements which would add greatly to his work when extremely busy.

Mr. Scrymgeour supported the bill with regrets that it did not cover another "dangerous poison"—an overt allusion to alcohol.

Sir Sydney Russell-Wells, after expressing the sympathy of the medical profession with the objects of the bill, said it would certainly require drastic treatment in Committee before it could be made a useful and efficient measure. The penalties which attached to any infraction were very heavy, and only two sets of penalties were provided—namely, a maximum fine of £1,000 and penal servitude for a period not exceeding ten years or both on conviction or on indictment, or, on summary conviction, a fine not exceeding £250 or imprisonment not exceeding twelve months or both; therefore the slightest offence might be visited with a severe penalty. While a penalty should bear some proportion to the profits made in illicit trading, this bill and the Act to which it was an amending measure created various offences other than the intentional and nefarious traffic in dangerous drugs. It would have been better to follow the precedent of the Food and Drugs Act and the various offences scheduled and classified with appropriate maximum penalties attached to each. He asked the House to consider the case of a doctor, who from carelessness or hurry amid professional emergencies, omitted to make the proper entries in the books he was required to keep, or did not retain invoices, or omitted some other technicality when prescribing one of the many poisons which would come under this bill. He would be liable to be mulcted in a fine of £1,000, or to be imprisoned for ten years or both, as if guilty of providing a drug taker with 10 lb. of cocaine. That was utterly ridiculous. The judges would no doubt administer the law with common sense, but why not suitably classify the offences? There was more reason for alarm with regard to penalties on summary conviction. It might be that the high penalty they had the power to inflict might make many magistrates consider any offence under this bill to be of unusual gravity. He did not think that many magistrates would inflict a fine of £250 for a technical offence, but an error of such a character should be provided against. There was another matter requiring attention. In the schedule of regulations under the Act any medical man prescribing one of these remedies for himself was guilty of an offence. The case put forward for this provision was that there were certain doctors who were drug takers. That was true, but their number was very small, yet in order to deal with the very few, mostly retired medical men, who had given way to these habits, it had been enacted that no medical man should prescribe for himself. He regretted there was no provision in this amending bill for sweeping away this ridiculous regulation. It was wrong because it hampered the doctor unnecessarily by creating a new offence and because as a preventive it was futile. A doctor could at present prescribe drugs for a patient; and naturally he must have a certain stock of them. They must be in his consulting room for emergency. There was not a practitioner in a thousand who did not constantly carry with him a case in which there was a certain quantity of morphine or cocaine, or both, for emergency use. Further, by writing a letter to a chemist a doctor could, legitimately, get a supply of these things for use in his own practice. He believed that when it came to a question of relieving pain, medical men would be willing to break the law for the purpose, but an Act which ought to be a real control over a bad and vicious practice would fall into disuse from such absurdities. Extreme inconvenience would be caused if a doctor could not telephone to a chemist from a patient's house for some drug he required. Incidentally, he wondered if members were aware of the amount of drugging carried on by means of so-called patent medicine. He had known cases of people who were morphine fiends, and they got their morphine through chlorodyne. Many other patent medicines contained the drugs now being considered. The Government might, when they were concerned with the Schedule of Poisons, insist that every patent medicine should bear on its label the substances it contained, or, at any rate, the poisonous substances and the exact proportion in which they existed. He sincerely hoped that the Government would consider a most drastic modification of this bill. He spoke on behalf of medical members of the House, as he was secretary of their committee.

In the subsequent discussion Sir John Simon expressed the opinion that it was very undesirable such maximum penalties should obtain for summary conviction. He also regretted that the bill did not state what were the dangerous drugs to which it applied. In order to understand the measure it was necessary to go back to the Statute of 1920, and after perusing a number of clauses make out a list of drugs. The point was the more important because Clause 3 of the bill dealt with a different list of poisons from the poisons dealt with under Clauses 1 and 2: for those affected by Clause 3 one had to go back to the Statute of 1868. He wondered whether such list, no doubt up to date and proper when the Pharmacy Act of 1868 was passed, was still regarded as such by those who had authority and knowledge of the subject.

The Home Secretary assured the House that he would consider the suggestions made. His wish was that the bill should be as clear and plain as possible, and he would see whether the dangerous drugs referred to could be specifically mentioned. While not admitting that the medical profession would be placed in the position indicated by Sir Sydney Russell-Wells, he promised to listen to any representation put forward to make the regulation more workable. As for the courts of summary jurisdiction, they were perfectly competent to deal with a case requiring a higher penalty.

Mr. Shinwell afterwards raised the question whether a ship was to be regarded as premises. Mr. Dennis Herbert gave two reasons for meeting the medical profession. The first was that they already had a very strict discipline of their own. The second was that they would not be stopped from doing illegal acts if they truly believed them in the interests of patients in very serious cases. Mr. Pringle regretted the title of the bill had been so drawn that no amendment of the Pharmacy Act could be introduced except as to Section 17, and that, therefore, one appeal by the Member for London University could not be met.

The Solicitor-General, in reply to a question, said that patent medicines were wholly out of the bill, and Dr. Chapple, who followed, observed that nothing showed more clearly that this was piecemeal legislation and very largely wasting the time of the House. Patent medicines containing many of these drugs were being advertised, and created a craving in hundreds and thousands of people. The Government should realize their responsibility of dealing with the whole question of patent medicines as poisonous drugs because they created this craving.

The bill was read a second time and referred to Standing Committee.

Dogs' Protection Bill.

The second reading of "The Dogs' Protection Bill" was submitted by Sir Frederick Banbury on March 2nd. As the third order on the day it was reached about 3.50, ten minutes before the hour at which Friday sittings end. Sir Frederick said that the measure had three times received a second reading in the Commons, twice without opposition, and once by a majority, and on one occasion it had passed the Committee and report stages, and only on third reading had it been rejected. Practically its only opponents were doctors (cries of "No, No"). Then the majority were doctors (cries of "No"). The time being short he simply moved the second reading.

Mr. Jack Jones seconded "the motion of his right honourable and dogmatic friend." He said he knew the argument that science demanded experiments, but let those who gave expression to such opinion submit themselves. He was willing to be experimented upon if it were necessary, but believed that there were other means of research whereby remedies could be found for the illness of mankind.

Dr. F. E. Fremantle said there was not time to advance a tithe of the arguments against this bill. The great point of research work was that when started in the laboratory, if the end could not be directly reached by the particular route selected, the net could be spread more widely, when results that could not have been anticipated might be revealed. Some such points could be revealed only by experiments on dogs. Dr. Fremantle was speaking when the debate was adjourned; this discussion to be resumed as opportunity might offer, on March 14th.

Health and Unemployment Insurance.—On a question by Mr. Rhys Davies, on February 28th, Viscount Wolmer stated that the Inter-Departmental Committee appointed by the Minister of Health and the Minister of Labour to consider the suggestion of the Geddes Economy Committee for a joint card for health and unemployment insurance, hoped to be able to report shortly.

Until the report was presented the Minister could not say whether it would be published. In view of the necessity of placing orders for the printing of cards some months in advance of their issue, it would not now be possible for the proposal for a joint card, if it were recommended, to be brought into operation by July next.

Expenditure on Health Insurance.—In a written answer to Mr. Rhys Davies, on February 27th, as to certain particulars of expenditure on National Insurance, Sir W. Joynson-Hicks said that the amounts annually expended in England and Wales out of National Health Insurance funds on the two accounts mentioned were approximately:

1. Provision of medical benefit (excluding drugs) by insurance practitioners £6,520,000
2. Provision of drugs and appliances 1,280,000

The amounts similarly expended in Scotland were (1) £870,000 and (2) £160,000. Medical benefit was not provided to insured persons in Ireland.

Tuberculosis Treatment.—Mr. Rhys Davies asked, on February 28th, the number of persons suffering from tuberculosis who had failed to secure admission to sanatoriums. Viscount Wolmer said that the number recommended for and awaiting treatment in residential institutions from local authorities in England and Wales on February 1st, 1923, was 2,902, on which date 16,393 persons were receiving such treatment, and there was a number of vacant beds. The Minister was not aware of the number of notified cases which had not been admitted to residential institutions; but not all notified cases received or were willing to receive such treatment.

The Supply of Insulin.—Dr. Chapple asked, on February 28th, whether, in view of the fact that the cost and scarcity of insulin were depriving many poor sufferers from diabetes of the measure of cure which it was able to provide, the Ministry of Health would make a special grant for its more rapid and abundant production. Viscount Wolmer replied it was not the poor only who were deprived of the advantages of insulin. It could not be made available until a supply of known efficiency, potency, and safety was attained upon a manufacturing scale. Considerable progress had been made by the Medical Research Council, which believed that, subject to limitation of raw material in particular districts, the successful manufacture of insulin in the near future was assured. No special grant-in-aid would accelerate the production at this stage.

Pasteurization of Milk.—Mr. Hope Simpson asked, on February 28th, whether the provisions of the Milk (Special Designation) Amendment Order, 1922, now lying on the table at the House, required employment of a plan for pasteurization, the expense of which was beyond the means of the smaller retail dairymen; and whether the application of this Order would tend to increase the power of the milk combine. Viscount Wolmer replied that some such representations had been made to the Minister, but he did not regard them as sufficient to justify a departure from the principles on which the Order had been made. "Pasteurization" was a designation applied to milk which had been subjected to certain heating processes as set out in the Order. Such processes could not be undertaken except by the adoption of the necessary means or machinery entailing some capital expenditure. There was nothing in the Order to compel any dairyman to pasteurize the milk he offered for sale.

Answers in Brief.

Approximately 3,000 ex-service men were at present receiving residential treatment in institutions for tuberculosis. The average cost of treatment was £2 17s. 6d. a week for each patient, and, in addition, treatment allowances averaging £2 a week for each patient were paid by the Department.

According to the annual returns 3,555 persons were proceeded against for alleged offences in the adulteration of food, drugs, etc., in 1921. Of these, 2,329 were convicted. In 1922, 2,400 persons were proceeded against, and of these 1,586 were convicted. These figures were provisional only.

Viscount Wolmer has stated that a medical officer of the Ministry of Health, who is about to visit Northumberland, will report on the disability of insured inhabitants on Holy Island owing to the fact that no doctor resided there.

In the cases of the ex-service men whose insanity had been adjudged not to be due to military service, there have been 328 appeals, of which 225 have been heard. Of these 77 have been decided in favour of the men.

If the existing system of taxation of income were so altered that the income of married persons were taxed separately, it is estimated that the immediate loss to the Exchequer would be £12,500,000, and the ultimate loss approximately £35,000,000.

The Home Secretary has stated that the Home Office Committee which dealt with compensation for industrial diseases had reported that there would be great difficulty in bringing pneumonoconiosis under the Act, and consequently in 1918 special legislation was passed to enable the matter to be dealt with on somewhat different lines. He had recently appointed a small committee to review the working of the scheme.

Sir W. Joynson-Hicks has stated that the effect of the report of the medical officer of health for the West Riding of Yorkshire, dealing with the condition of cowsheds in the administrative area, appeared to be that the existing law was not satisfactorily enforced in the county by reason of the small amount of inspection carried out by the district councils who were responsible for its enforcement. Under Section 11 of the Milk and Dairies (Amendment) Act, 1922, the county council could apply to the Minister of Health to transfer to it the powers of any defaulting district council.

Of the 977 voluntary boarders resident in licensed houses and registered hospitals for mental patients during the year 1922, in the first named 88 were detained and certified and 3 were certified and sent to other institutions; in registered hospitals 57 were detained and certified and 5 were certified and sent to other institutions.

An Address
ON
RELIGION AND SOME MEDICO-SOCIOLOGICAL PROBLEMS.

DELIVERED TO THE MARYLEBONE DIVISION
BY
THE DEAN OF ST. PAUL'S.

AT a largely attended meeting of the Marylebone Division of the British Medical Association on March 2nd the DEAN OF ST. PAUL'S (the Very Rev. W. Ralph Inge, D.D.) gave an address.

The DEAN said that when he was honoured with the invitation to address that gathering it was suggested that he might take one of those subjects which were interesting alike to the physician of the body and the physician of the soul. A closer co-operation between the medical and the clerical professions had long been a matter very near to his heart. There were so many respects in which the work of the two professions overlapped or even coincided, and with knowledge and goodwill the clergy and medical men might be brought closer together, to the great benefit of mankind.

Mental and Spiritual Healing.

It was very necessary that religion should become scientific, and that science should cease to be—if it ever was—materialistic. Nevertheless, when one left generalities of that kind, the difficulties of the position became obvious. There were in evidence, for example, various methods of faith healing, from Christian Science to the creed of M. Coué; it was difficult to say how far these methods had any scientific value. Before the war he was a member of a committee sitting at Westminster, composed half of clergymen and half of doctors, the object of which was to investigate the methods of mind cure and faith healing which were advertised or followed. When the committee examined those who professed to work miraculous cures by religious means his own impression was far from favourable. It seemed to him that not only did their evidence break down, but their whole attitude was unsatisfactory. The committee had just begun on Christian Science—whose advocates were very ready to furnish it with information—when the war broke out, and the committee had had no further sittings. The only witnesses who impressed him at all were two doctors who had been engaged in treatment by suggestion. They stated that they never attempted to treat any organic disease, but he began to be a little dissatisfied the other way after hearing their evidence, for it seemed to him that they regarded it as a dogma that no organic disease could be successfully dealt with by these methods, and therefore when they cured patients whose cases had been so diagnosed by other doctors they assumed that the diagnosis was incorrect. He could not help pointing out to them that that was exactly what the committee had met to decide—whether treatment by suggestion could benefit organic disease. All were agreed that hysterical and nervous cases were benefited by these methods, and equally that such a thing as a broken leg could hardly be benefited; but there was a large class of intermediate cases, including diseases caused by micro-organisms, about which more evidence was desirable. He wanted to know whether or not the encouragement of the patient and the awakening in his mind of a lively faith that something was going to happen might have some effect, possibly by the production of some kind of hormone, actually to destroy the germs of disease. At all events, of late years the functions of the ductless glands had excited very great interest, and there was still much to learn about their action. When Edward VII, not many years before his death, was in Germany he was found to be suffering from a mild form of diabetes, and a consultation took place, attended by four German doctors and one English doctor. The Germans became so furious with each other as almost to get to blows, and after the altercation had gone on for some time the English doctor said, "Really, gentlemen, I believe that if we took our tests we should find that most of us were suffering from glycosuria." Rather impressed by this idea, the Germans did make the test, and found that three out of the four had sugar. If this could be the consequence of anger, as seemed probable in this instance, it was possible that the awakening of a lively hope in the mind of the patient might have effects not yet determined in the opposite direction.

The Storm Centre of Morals.

The Dean then turned to the subject of psycho-analysis. It had been stated that Freud, whom he had never read, had only one idea, and that a nasty one; but he imagined that

there was a great deal more in Freud than that. The vulgarization of psycho-analysis was doing an enormous amount of harm by encouraging young people to think that they had a right to indulge their passions, and that to repress them was bad for health both of body and mind. The special subject on which he was venturing to speak that evening was difficult and delicate, but he thought that no apology was needed for choosing it, for it was really the storm centre of morals at the present time, and it was a subject on which the clergy and all who were not doctors required a good deal of instruction. Some years ago he preached in St. Paul's to a medical congress and hinted that he thought the medical profession had been a little wanting in candour and courage because it had not told the public certain things which the public ought to know. He touched especially on the subject of venereal disease, which at that time was still taboo. He urged that the question ought not simply to be shelved, but should be thoroughly thrashed out and discussed. Since then, of course, the question had been brought out into the open, and newspapers no longer refused to give it publicity.

He did not intend to say much on the question of prophylaxis, which had divided medical opinion, though here one would wish that clergy and doctors should work together. No defence was possible of the former attitude of the majority of Churchmen that these diseases were sent by God as a punishment for sin, and therefore ought to be left to run their course. The real question to be faced, if the clergy were to co-operate with the doctors whole-heartedly on this matter, was the attitude to be taken towards prostitution. Was prostitution to be considered a necessary fact in civilization? All those present would agree with him that if that institution, said to be the oldest in the world, could be suspended for five or ten years, these diseases would be brought within manageable compass, and probably within a single generation would be wiped out. Prostitution was not only antichristian but antidemocratic, cruel, degrading, and indefensible, and however impossible it might seem at present to wage war against it successfully, such warfare was a thing they must never give up. Plato, speaking of the unnatural vice which was common in the Greece of his time, said that its abolition, however desirable, was a castle in the air; yet, owing to various causes, of which Christianity was one, that particular vice had been driven underground, and had become enormously less common than in pagan times. Plato also spoke in a very fine way on the general question of continence, reminding his readers that a great many athletes maintained perfect continence during their training, and if these men exercised this self-restraint for a corruptible crown, how much more should they all for an incorruptible. The clergy wanted to be assured that doctors were doing all they could to discourage young men from promiscuous intercourse. He had been reading a German book on population—he did not think the author was a religious man—which declared that every doctor ought to warn his patients that there was only one certain way of escaping these diseases, and that was by avoiding promiscuous intercourse altogether.

The Preaching of Continence.

Much more knowledge was needed on the whole question of continence. The strangest views were propounded, as, for example, that continence was impossible—a view very freely held on the Continent, even by physicians. He had not himself heard many confessions, but, so far as his observation had extended, human nature presented enormous differences in this respect, and there were a very large number of people who not only remained chaste during boyhood and youth, but were never very seriously tempted to be otherwise. When he was at Eton he believed the very large majority of the boys lived cleanly, and he was very decidedly of that opinion with regard to his friends and companions at Cambridge. On the other hand, there were some who held that continence was easy and harmless for all. The facts, so far as he knew them, were that there were a very large number of people who would be much healthier and happier married than single, but that probably in no case did any serious physical consequences result from the pure single life. That, he thought, was what most doctors would say so far as men were concerned; whether they would say the same about women was more doubtful. Vital statistics were sometimes appealed to to show that celibacy shortened life; but these statistics were vitiated by the fact that a good many unmarried people shortened their lives, not by continence, but by promiscuous intercourse, and by the fact that the reason why many people did not marry was ill health or general weakliness. On the other hand, there were the unusually long lives of many celibate priests.

Many years ago he was asked to subscribe to a religious society for the encouragement of sexual purity. This society circulated a sermon by Dr. Pusey, which contained a very lurid but not altogether untrue description of venereal disease, and then went on to speak in even stronger terms of those solitary bad habits into which the schoolboy and the schoolgirl are prone to fall. Dr. Pusey said that his brain reeled when he thought of the punishments of God upon this sin—insanity, blindness, and so forth. He (the Dean) wrote back and said that he could not give the society any support so long as it circulated that sermon, because not only were the statements untrue and cruel, but they were almost certain in many cases to produce sexual hypochondria. Many would be familiar with a monograph by Sir James Paget showing the terrible mischief done by threats which had no scientific support at all. The society promised that the sermon should be withdrawn.

He next touched upon public school morality. Many people considered that a form of immorality which was sometimes found in public schools was utterly unnatural and monstrous. But it was desirable that it should be known that during the first two or three years after puberty the sexual impulse was quite undifferentiated, and there was nothing at all unnatural in boys falling in love with each other or in girls doing the same. Of course, those in charge of the schools must prevent such affections finding any impure outlet, but there was nothing innately shocking in such affections, and in normal cases, he imagined, the impulse died away before 21. One heard occasionally also of elderly men who had lived a more or less respectable life falling suddenly into this vice, perhaps bringing about their social ruin. In the majority of cases he believed this was purely a pathological thing, indicating not only the approaching extinction of the sexual powers, but in many cases a tumour of the brain or some other condition of oncoming insanity. It might be that very cruel injustice was done by condemning as utterly reprobate and abominable men who were not responsible for their actions. Here, again, there was need for enlightenment from medicine.

Birth Control.

Finally, the Dean spoke on birth control—a social, racial, and economic, as well as a moral and medical question. He reminded the audience of the facts with regard to the increase of population. The birth rate in this country reached its maximum of 36 per 1,000 in 1877, when the death rate was 21 or 22. The birth rate had declined, almost in a straight line, except for the war years, until last year the figure was 20 per 1,000. The death rate, thanks mainly to the skill of the medical profession, had declined in a parallel line, and last year was 12 per 1,000. Were there any in that room who would hold that the old birth rate of 36 per 1,000 could have been maintained, in view of overcrowding and unemployment, with a death rate of 12? It seemed to him quite obvious that in some way or other the birth rate had to decline, and also that a time must be reached—not very far ahead—when this country could no longer support a further increase in the number of its inhabitants. That being the case, it did not seem very creditable either to their profession or his own that they should have joined in discountenancing and condemning any attempts to regulate the birth rate, and he said this with the more confidence because the statistics showed that the very bottom place in the birth rate was held by the members of their two professions. That was not satisfactory, nor even honest. The differential birth rate, of course, was a very striking and dangerous symptom—the birth rate was two and a half times as high among unskilled labourers as among members of the learned professions. With regard to methods of controlling births, opinions differed both as to moral and medical aspects. He would plead only for candour and honesty.

His main object in that address had been to ask the medical profession to enlighten the public more than in the past. A great amount of ignorance, not confined to uneducated people, prevailed on all matters relating to sex. He wondered whether it was not possible for a handbook to be issued by an influential and authoritative body of doctors setting forth those facts which it was most useful for clergy and teachers and parents to know. This handbook should include some information on eugenics and the diseases which were strongly inheritable with a view to impressing it as a patriotic duty on those suffering from such diseases that they should abstain

from parentage. Doctors in these days had entered into the position of the priests of the Middle Ages. They heard confessions, they imposed penances, sometimes fantastic ones. They were listened to, and what they said was accepted as authoritative. The physical and moral welfare of the country was largely in their hands. Let them tell the public what it was good for the public to know, and especially the clergy, to save them from making all manner of disastrous mistakes.

Discussion.

The CHAIRMAN (Dr. F. W. Goodbody) said that much of the credit of bringing the question of venereal disease out into the open belonged to the British Medical Association. He recalled that a large proportion of the signatures to a letter on the subject which appeared in the general press in 1913 were obtained at the Brighton meeting of the Association.

Mr. MCADAM ECCLES said that he had the privilege of being present on most of the occasions when the committee of which the Dean had spoken was sitting at Westminster to consider the question of spiritual healing, and he recalled what a great amount of illumination both the clergy and the medical members received. As an outcome of the deliberations, the idea in his own mind was fixed that there were certain conditions upon which no amount of faith or any other form of mental healing would have any effect. He did not agree with the Dean, however, in putting a fractured leg out of account, because the patient who was suffering agony from a fracture could be helped by a process of mental solace combined with a slight physical action in the shape of massage. This produced no direct effect upon the fractured ends, but it put the patient into such a condition that nature could come in and help to unite the fracture. With a congenital deformity, however, he did not believe that any type of spiritual or mental healing would have the slightest effect. Mr. McAdam Eccles also made some remarks on the question of public school morality.

Dr. CRICHTON MILLER thought that the Dean's argument on birth control left a fallacy which was continually creeping into this question. If it were correct from the eugenic point of view that racially they should propagate less, it was no less necessary, but even more necessary, that the next generation should come from the above-par and not from the below-par portion of the population. Whether the indications of eugenics were that the birth rate should go up or come down, the above-par section of the population should be fully represented in the birth rate.

Mr. BISHOP HARMAN said that he was not afraid that the people of this country would degenerate because the professional classes did not breed at the same rate as the hardy labourer. If the pedigrees of any well born family were traced it would be found again and again that the family had been rejuvenated by stocks from very lowly ranks, and it was clear that often genius had come by way of this lowlier introduction. Referring to what the Dean had said about Dr. Pusey's sermon, Mr. Harman expressed the opinion that a great deal of harm was done by certain lurid pamphlets which depicted in overdrawn terms to frightened youths the consequences of a habit into which they had fallen, not always as the result of bad example or natural depravity, but more or less innocently. He could not understand the attitude of mind of those who cried out against a legitimate measure of birth control and the spacing out of the family, and when people who themselves were celibate cried out against it the position became absurd. Birth control began with the postponement of marriage; from plain physiological facts it was evident that the later the marriage the less would be the procreation. He did not believe that the professional classes practised birth control so much by deliberately reducing their families after marriage as they did by postponing marriage to such an age that the resulting families could not be large. He saw nothing immoral in a properly regulated practice of spacing births. In conclusion, he thought it something to be proud of that in a great city like London there was so much happiness and well-being, so much mutual forbearance and good humour, and so much comeliness of person and dwelling.

Dr. C. F. HARFORD believed that psychotherapy was only just at its beginning. While not himself a Freudian, he thought that the revelation which had come through Freud ought to be recognized, and when it was considered how extraordinarily the sexual problem came into prominence, some care ought to be exercised in criticizing Freud. The best results would be secured in dealing with the abuses of the day from mental hygiene.

A VISITOR whose name was not given declared himself to be the fourteenth child of his parents, and he himself urged the advantages of large families. It was the solitary child, not the child in a large family, who became addicted to self-abuse. If England practised birth control she would lose her empire.

Dean INGE, in reply to a warmly accorded vote of thanks, said that still more discussion between the two professions was desirable. He had been laying stress on what was, perhaps, the more important side of such discussion—namely, the advantage the clergy would derive from more instruction from the medical profession. But he knew that many medical men in their practice realized the importance of religious belief in curing the sick body as well as the sick mind. Nothing was more untrue than the French proverb that where there were three doctors there were two atheists. He had found in his own experience of the profession a deep spiritual sense and the feeling of a priestly vocation. Some of the most famous physicians owed a great deal of their success to their power, not only of reading character, but of acting upon character, and very often by purely religious or spiritual methods. The new psychology had thrown a great deal of new light on the nature of temptation and the best way of resisting it, and it was to be hoped that before very long this new knowledge might be co-ordinated and systematized, and put into a form available for responsible teachers.

England and Wales.

PRESENTATION TO SIR DAVID DRUMMOND.

THAT it was a happy thought and a gracious act on the part of his colleagues to entertain Sir David Drummond to dinner on the occasion of his knighthood, and to present him with a piece of silver, was proved by the large number of friends who gathered in the King's Hall of the Armstrong College, Newcastle-on-Tyne, on February 28th. The dinner was, practically speaking, confined to the teaching staffs of the College of Medicine, the Royal Victoria Infirmary, the Maternity, Fever, and Dental Hospitals, and representatives from Armstrong College. Between eighty and ninety ladies and gentlemen were present. Dr. Cecil A. Cochran, chairman of council of Armstrong College and honorary treasurer of the University of Durham College of Medicine, presided. After the loyal toast had been honoured, the chairman proposed the health of "Our Guest." In a well arranged and thoughtful speech, masterly in detail yet in no wise savouring of redundancy, Dr. Cochran briefly reviewed circumstances in the life and professional career of Sir David Drummond which had led to his being recognized as worthy of the honour which had been conferred. In the College of Medicine he had held the chairs of therapeutics, physiology, and pathology, and finally of medicine; on the death of Sir George Hare Philipson he was appointed president of the college, a position which he had filled with dignity and to the benefit of all concerned. To the Royal Victoria Infirmary he had given many years of useful service, and by the patients his visits had been much appreciated. Two years ago Sir David was appointed vice-chancellor of the University of Durham. It was a timely appointment, for his year of office coincided with the visit to Newcastle-upon-Tyne of the British Medical Association, of which he had been elected president, one of the highest honours of the medical profession. All knew how well he discharged the duties of that office. Sir David Drummond's kindly manner and urbanity contributed considerably to the success of that meeting. Of their guest's professional abilities he would in such a gathering say nothing other than that several years ago he had been through his hands, and could therefore add his own testimony of appreciation to that of others of his patients. It was his pleasure not only to wish Sir David and Lady Drummond all the good things possible which an extended life might bring to them and to their family, but to ask their guest to receive, in the name of the members of the College of Medicine, the staffs of the Royal Victoria Infirmary, the Maternity and Fever Hospitals, a loving cup bearing the London hall-mark 1765, as a souvenir of the occasion, and to express the hope that it would be treasured by himself and by his family.

Sir David Drummond was not less happy in his reply than the chairman in his speech. There came, he said, occasions in the life of most men when they were embarrassed and

overcome by the kindness of their friends. Such was his position at the moment. In no words could he adequately express his feelings. He was much touched by the many indications of friendliness which the conferment of the honour had elicited, as revealed in the several hundreds of letters he had received. Many of these alluded to the honour having been long delayed. To that circumstance he himself took no exception. Others alluded to his youthful appearance and asked him for the secret. He had no secrets that he would give, other than that in having his two sons living with him he was constantly in touch with modern opinions and with the changing thought of the times. Nor was he above playing with his grandchildren. From these and other sources he drew the influences which kept him young. There were several things which had contributed to such success as he had achieved. Shortly after he came to Newcastle a vacancy occurred on the staff of the infirmary, and he obtained the appointment, and for over thirty years, as they had been told, he was an active member of the staff. Other appointments gradually came his way, for opportunity had befriended him. On one occasion he asked a well known predecessor in office in the College of Medicine as to how success and honour had come to him, and the friend replied that it was by always having the best of everything and by compliance with conformity. There was much in this attitude to men and things which was true and worthy of copy. So far as his own professional career was concerned he had always attached great importance, as Professor Stuart McDonald knew, to frequent visits to the *post-mortem* room in the infirmary. Correlating the present with the past and looking to the future he too could only express the hope that there was still some useful work left for him to do. To him at any rate there were solace and comfort in the words:

> "Grow old along with me,
> The best is yet to be,
> The last of life for which the first was made."

Sir Theodore Morison, Principal of Armstrong College, proposed a vote of thanks to the chairman, who in responding thanked those who had so successfully contributed by voice and instrument to the harmony of the evening.

POST-GRADUATE WORK OF THE UNIVERSITY OF BRISTOL.

Arrangements have been made for a series of post-graduate demonstrations to be given in the medical theatre of the University of Bristol during April and May. The demonstrations will be given at 3.30 on Thursdays, beginning on April 12th, and will be followed by discussions. The demonstrations of the present course will deal with nasal catarrh, conjunctivitis, painful feet, endocrinology, cardio-vascular disease, the treatment of stricture and prostatic enlargement, hysteria, and normal and acquired resistance to disease. The fee for the course is one guinea. Further particulars can be obtained from the Director, Post-Graduate Medical Studies, Pathological Department, University of Bristol, who will also supply information with regard to the subjects which will be available for the selection of courses of study at local centres during 1923.

NEW AMBULANCE STATIONS IN LONDON.

The London County Council proposes to establish three new ambulance stations—at Highbury, Paddington Green, and Clapham Junction. When the service was established in 1915 six stations were provided, and a definite area allotted to each. For a few years the stations were able to deal with the calls within their respective areas, but as the efficiency of the service became known calls from other districts became increasingly frequent, leading, on occasion, to two or even three ambulances being absent from their own districts. During a recent period of eight months the average time taken to reach each case dealt with by the service was 8.7 minutes from the receipt of the call at headquarters, but in certain boroughs, more particularly those to be served by the new stations, the average time was 10, 11, or even 12 minutes. The cost of the new stations, in buildings, ambulances, and equipment, will be £7,650, and in annual maintenance about £6,300. As an experiment in economy, at one outlying station only one attendant instead of the usual two (in addition to the driver) is to accompany the ambulance in response to calls.

Scotland.

REPORT OF THE ROYAL EDINBURGH ASYLUM.

THE 110th annual report of the Royal Asylum at Morningside, Edinburgh, which appeared last week, affords as usual much interesting information. The patients treated during the year number 1,536, of whom 123 were discharged recovered, 221 were discharged unrecovered, and 167 died. An appeal is made for subscriptions to help relatives who are endeavouring to pay for the maintenance and treatment of patients, so as to prevent their falling into the category of pauper lunatics. It is pointed out that the current cost for a patient in this asylum is between £60 and £70, and that if the charitable support of mental hospitals were as great as that of hospitals for bodily diseases the managers would be enabled to make grants to the friends of patients for this purpose. The managers have in contemplation the erection of an out-patient department to the east of the entrance to the asylum. It is intended that this should be available both for purposes of consultation, like the out-patient department of an ordinary hospital, and also, since beds would be available in the clinic, for the reception of patients for short periods of treatment without the necessity of any legal formalities. Four nursing homes for nervous or mild mental disorders already exist in Edinburgh, and here early cases can be treated by the family physician without the patient being certified or sent to an asylum. This practice is legal in Scotland although not in England, and these homes have received much attention from visitors from England, the Dominions, and America. With regard to the practice of psycho-analysis, it is admitted that no dramatic recoveries are to be expected by such means in the vast majority of cases of definite mental disorder. Nevertheless the employment of psychotherapy gives to the attendant an understanding of the patient's symptoms and mentality which is of the utmost value in general treatment and management. The substantial decrease of the annual deaths from general paralysis in England and Wales during the three years 1919–21 amounts to 28 per cent. in the case of men and 41 per cent. in the case of women, but is not so noticeable in Scotland, where the reductions amount to 12 per cent. for males and 6 per cent. for females, as compared with the average of the previous twelve years. The explanation offered is that the severe influenza epidemic of 1918 may have exerted a protective influence such as malaria is alleged to afford, or that the recent lessened consumption of alcohol may be the effective factor.

RECTORIAL ADDRESS IN EDINBURGH.

The Right Hon. D. Lloyd George last week delivered his address as Lord Rector to the students of Edinburgh University, taking as his subject "The qualities of a politician." On this occasion the reception accorded to the Lord Rector was even more boisterous than usual. Paper streamers hanging from the sounding wires, coloured balloons filled with buoyant gas, and a gigantic leek suspended over and in front of the speaker decorated the M'Ewan Hall, in which the address was delivered. Mr. Lloyd George had a fairly good hearing, though there were constant impromptu interruptions, to which he retorted with a readiness that won the enthusiastic applause of his student audience. He regarded courage as the first requisite of the politician who desired success, and next after it he placed a training in clear effective speech. At the luncheon in the Students' Union which followed the address Mr. Lloyd George referred to the fact that seven of his colleagues in the late Government had been graduates of the University of Edinburgh. The occasion ended with the usual torchlight procession in the evening, which was remarkable in the history of these carnivals for the great number of women students who took part.

DECLINE OF TUBERCULOSIS.

The Committee of Management of the Royal Victoria Hospital Tuberculosis Trust in its eighth annual report submitted statistics showing that the mortality from tuberculosis had fallen during the twenty-five years 1890–1915 by 30.9 per cent. in England and by 42.4 per cent. in Scotland. Tuberculosis had not been increased by the war, and in 1920 a further drop had taken place, which was maintained in 1921. During the past year this Trust had opened the Southfield Sanatorium Colony, which it was hoped would soon be expanded to one hundred beds.

ROYAL (DICK) VETERINARY COLLEGE CENTENARY.

At a recent meeting of the governors of the Royal (Dick) Veterinary College it was intimated that the Secretary for Scotland, through the Board of Agriculture, had agreed to discharge obligations of the College, and to provide an annual sum to meet the financial deficit in future between income and expenditure. This promise of help is satisfactory since the College, in addition to training veterinary students, does a large amount of valuable research work and forms an important adjunct of the University in regard to the diplomas of B.Sc. and D.Sc. in Veterinary Science. The College celebrates this year the hundredth anniversary of its foundation, as it was in November, 1823, that William Dick, the founder, delivered his first lecture. Originally little more than a lecture room and a shoeing forge, repeated additions were made until the school was rebuilt, first in 1886, in Clyde Street, and again, on its present site at Summerhall, in 1916. Valuable scientific and educational work has been done in the past century by the college, and its old students are scattered all over the world. As a permanent memorial of the centenary it is proposed to found a post-graduate research fellowship, on such a basis that the holder may be able to study the cause and prevention of animal disease, not only in this country, but also in institutions abroad. For the purpose of the endowment of this fellowship a bazaar is to be held in Edinburgh at the end of November; this, on account of the close relation of modern veterinary science to preventive medicine, will, we do not doubt, have the support of the medical profession.

Ireland.

SUPERANNUATION OF DISPENSARY DOCTORS AND DISPENSARY MIDWIVES.

AT a recent meeting of the Dail (Irish Free State Parliament) Sir James Craig, M.D. (Dublin University), moved the following amendment to the Local Government (Temporary Provisions Bill):—To add to Subsection (5) the following:

"A dispensary doctor or a dispensary midwife, who has become incapable of discharging the duties of his or her office with efficiency, by reason of a permanent infirmity of mind or body, and who has served as an officer of a local authority for not less than twenty years, may, with the permission of the Minister, be allowed to resign his or her office, and he or she shall be entitled to receive from the local authority an allowance not exceeding two-thirds of the salary, fees, and emoluments which he or she was in receipt of at the time of his or her resignation."

Sir James Craig said that he was aware that the amendment might be ruled out of order because it suggested something of a permanent character in dealing with a temporary bill. There was, however, a strong case for the amendment. He knew that dispensary medical officers, and midwives also, remained in office long after they were capable of performing their duties, because the pension to which they would be entitled was so small that they would not be able to live on it. That dispensary medical officers or midwives should remain in office when by reason of infirmity of mind or body they were unable to perform their duties properly was unfair to them and a most serious matter for the poor of the district. Sir James Craig quoted the case of a dispensary doctor in Connaught who had to cover fourteen square Irish miles, and continued as follows:

He is getting £220 a year as dispensary medical officer. He is getting £15 a year as medical officer of health. Ye Gods! think of £15 a year—10d. a day for looking after the public health in an area covering fourteen Irish miles. He tells me also that under no circumstances could he possibly make more than £50 a year in private practice. He has possibly to keep a motor and possibly a manservant, and he makes the comparison (I think justly) with the National School teacher in his neighbourhood, who receives from £300 to £500 a year for five or six hours a day. The doctor is liable to be called out at all hours of the day and night to cover this huge district, and he has to go into houses where typhus fever is frequently rampant. The point I make is that an attempt should be made to encourage people of good education to go to those districts, and unless they are going to get a decent salary and pension when no longer fit to perform their duties I do not think that such men would go there.

Mr. Lyons (Labour) in supporting the amendment, said that some country doctors were certainly very badly hit. It had been the custom to include emoluments and bonus when calculating superannuation; the bonus would only count since the war, but were any proposal made to do away with it he would wish to see the amount added to the salary. It was essential to give a professional man a living wage, and he heartily agreed with Sir James Craig that steps should be taken to encourage the best men to go to the country districts. For this they must be suitably paid and no member of a local council should try to repudiate standing orders to the effect that doctors shall receive superannuation up to two-thirds of their salaries. He approved Sir James Craig's amendment that midwives and dispensary doctors in feeble or delicate health should be allowed to resign and receive two-thirds of their salaries.

Mr. Ernest Blythe (Minister of Local Government) said that the bill, if carried, would only run for twelve months, and it was not right to propose any change not required by an immediate emergency or to correct some confusion that had arisen. He understood that the fixed rule was that a medical officer of twenty years' service, on retiring on account of infirmity or any other cause, was entitled to receive two-thirds of his salary as a pension; this had the appearance, at least, of undue generosity. He knew cases where doctors, like other people, had got medical certificates to the effect that they were unfit for work, who afterwards proved not to be so ill as supposed. At present a dispensary medical officer was entitled to a pension if with ten years' service; if with less than ten years he was entitled to a gratuity. The pension could not be less than one-third of the salary, and if the doctor appealed it was possible for the Department in its discretion to increase the pension up to two-thirds. If a doctor retired on account of ill health after twenty years his position, which before the Act of 1919 was perhaps somewhat unsatisfactory, was now reasonably satisfactory; he could not accept the amendment.

Sir James Craig said he did not wish to press the amendment if the Minister would not accept it; if the principle were accepted he would be satisfied.

Professor W. Magennis (National University) appealed to Sir James Craig to stand his ground and to obtain recognition of the principle. A pension was deferred pay, and he appealed to every democratic member to remember that one of the fundamental principles of democracy was that the labourer is worthy of his hire. The amendment was designed to encourage medical practitioners with high qualifications to enter the service; he hoped that Sir James Craig, if the principle were accepted, would ask as a corollary that the amount given by the Act of 1919 should be increased. In reply to the argument that a permanent change should not be made in a temporary bill, Professor Magennis contended that the Minister had himself strongly defended a clause which would alter permanently the financial resources of the people it affected. He called on the Dail to place on record that it did not approve of the niggardly treatment of the medical servants of the public, particularly in the poor districts.

Mr. Blythe, in reply, promised that a permanent Act should at once be prepared and that every consideration would be given to the proposal of Sir James Craig, who thereupon withdrew his amendment.

Correspondence.

DR. HALDANE'S CONCEPTIONS OF BIOLOGY.

SIR,—The attention of all your readers must have been arrested by the masterly and impressive Lecture of Dr. Haldane in your columns of March 3rd. The law of reciprocal reaction could not have been set forth and illustrated in a more telling way. May one of your readers, unversed in philosophy, venture, for others' sake perhaps as well as for his own, to ask one or two questions of the accomplished writer? Dr. Haldane makes much use of the words "mechanism" and "mechanistic"; he uses also the words "machine" and "mechanical." If there be a difference may we have it defined? If there be none, we artless persons would find "machine" (or machinery) and "mechanical" more familiar, more lucid. If "mechanistic" be more abstract is it not the more vague? Now by a machine do not we mean some tool—say a chisel or a locomotive engine—which is but an extension and fortification of the human hand or limb? Apart from man's hand it has no energy, no life; it cannot direct itself, it cannot grow or feed itself, it cannot repair itself. If this be so, how can a living creature be called in any sense, or in any philosophy, mechanical? Yet Dr. Haldane speaks of "the mechanism of kidney secretion" (p. 362). It is true he says that such it cannot be, but does he not use a great deal of protestation about it! Nay, may he not be deceiving himself if he concedes something more to the word than he would attribute, say, to a hammer or a spade? May he not be tending to use the word "mechanical" to mean an inviolable order of events? If so does he resent or discredit this inviolable order?

One more question: Dr. Haldane's conception of the peculiar qualities of life in action is as large and vivid as it is intimate; but where are we to begin? Where do we take off? If life is a circle, not vicious but virtuous, how and where does the circle establish itself? In other words, where are the marches, if any there be, between life and not life? For example, Dr. Haldane—who of course cannot in one

lecture deal with every side of his vast subject—says little of biophysics, and, I think, nothing of the properties of colloids? But is he of opinion that there are no features in these activities, inward and outward, of molecular groups or of colloids that verge or even trespass upon those of life?

Before I close, may I reflect upon the word "environment," as ugly and ineffectual? Dr. Haldane probably feels this defect, as we all have felt it. In certain of his sentences, especially in such sentences as the "internal environment of a cell" the phrase hardly speaks for itself; it does not tell. Cannot some other and better word be found?—I am, etc.,

Cambridge, March 6th. C. A.

FUNCTION OF THE ADRENAL GLANDS AND ITS RELATION TO CONCENTRATION OF HYDROGEN IONS.

SIR,—Further work has led me to modify the final conclusion of my paper on the above subject—an abstract of which appeared in the BRITISH MEDICAL JOURNAL of January 20th. In the full paper, appearing in the April number of the *Indian Journal of Medical Research*, this conclusion will read as follows:

"While the attempted exercise of an emergency function by the adrenal glands may be expected to occur in conditions of grave acidosis the effect of lesser degrees of acidosis will be to enhance the action of such amounts of epinephrin as are normally discharged by the adrenal glands."

—I am, etc.,

Coonoor, India, February 13th. R. MCCARRISON.

THE ORIGIN OF PITUITARY SECRETIONS.

SIR,—It is generally admitted that the terminology of the pituitary and of the extracts prepared from the gland is regrettably confused. The lack of uniformity is partly due to the fact that pharmacological investigation into the effect of pituitary extracts has not been brought into satisfactory relation with the histological differentiation of this organ. The following suggestion, which emerges from work on amphibia, may indicate a line of inquiry which can perhaps throw light on the question in its medical bearing.

On the medical side, at least two categories of response are of interest in connexion with the action of "posterior lobe" extracts: the pressor effect and the more general influence exercised upon plain muscle, such as that of the uterus. The recent work of Dale, and of Dudley and Dale, provides very strong confirmation for the view, due originally to Schafer, that these responses are evoked by distinct autacoids, the "pressor" and "oxytoxic" substances. The pars intermedia, hitherto regarded as the sole glandular portion of the posterior lobe, has generally been recognized as the source of these secretions, which are supposed to diffuse into the pars nervosa. This interpretation is not without difficulty. Herring (1914) showed that whereas extracts of the pars intermedia of the mammalian pituitary have an oxytoxic activity little less than that of the pars nervosa, the pressor effect is almost exclusively restricted to extracts of the latter. Since the work of Herring new light on the comparative physiology of the pituitary has been shed by the researches of Tilney and Atwell, who have shown conclusively that there are three epithelial constituents of the gland—the pars anterior, pars intermedia, and pars tuberalis. In mammals the pars tuberalis lies dorsal to and sometimes in contact with the pars intermedia, being applied closely to the floor of the brain, so that anatomically the two are not distinguishable except in certain cytological peculiarities and by their totally different derivation in the embryo. In many lower vertebrates, on the other hand, especially in frogs and toads, the three lobes are both histologically distinct and anatomically discontinuous, the pars tuberalis forming two separate glandular plaques on the sides of the tuber cinereum. Judged from the pressor, "galactogogue," and pigmentary responses which they elicit posterior lobe secretions are physiologically equivalent in amphibia and mammals; and it has been conclusively shown by Allen (1920) and Swingle (1921) that the pars intermedia secretion and not that of the pars tuberalis is responsible for the pigmentary response which occurs in amphibia. Since the pigmentary response is almost certainly not elicited by the pressor, but probably by the oxytoxic or uterine stimulant (Hogben and Winton, 1922), it is not unnatural to suppose that the two posterior lobe secretions originate in the two distinct glandular components of the posterior lobe, the pressor secretion in the pars tuberalis and the oxytoxic substance in the pars intermedia. This would satisfactorily explain Herring's observations, and if substantiated provide an agreeable basis for a more uniform nomenclature.

The suggestion is amenable to experimental test, since all the lobes of the gland can be readily separated for testing with the assistance of a binocular in the case of the common frog. It may, therefore, be of interest to those who are studying the pituitary from the pharmacological standpoint.—I am, etc.,

LANCELOT T. HOGBEN,
Lecturer in Experimental Zoology, University of Edinburgh.
February 22nd.

PRIMARY UNION AFTER OPERATION FOR APPENDICITIS.

SIR,—I was surprised to read in Mr. Riddell's paper on primary union after operation for suppurative appendicitis (February 24th, p. 322) that he had had unfavourable results by treating similar wound conditions with bipp.

In Mr. Willan's clinic in the Royal Victoria Infirmary, Newcastle, it has been the practice for some years to treat the cut abdominal wall by the bipp method in all cases of suppurative appendicitis. It should be stated that in most cases it has been customary to drain the abscess cavity for a few days as a precautionary measure.

Mr. Willan alone, in his war service and in his clinic here, has done considerably over eighty cases. The results have been uniformly good; suppuration in the abdominal wall wound, formerly an expected result, is now quite rare, thanks to bipp. Convalescence is materially shortened, important alike for patient and for the earlier freeing of a much needed public hospital bed. Further, post-operative hernia following suppurating appendicitis is now seldom seen. The bipp should be applied to the cut abdominal wall before the peritoneal cavity is opened, both to the subcutaneous tissues and the muscles; but it should be emphasized that success by this method can be assured only if the surgeon faithfully adheres to the details laid down by Professor Rutherford Morison; these details can be obtained on referring to his book on *Bipp Treatment of War Wounds*, published by the Oxford Press.—I am, etc.,

JOHN BRUMWELL,
Hon. Surgical Registrar.
Newcastle-on-Tyne, March 2nd.

HOSPITAL POLICY.

SIR,—"I told you so" is usually the most irritating and ungracious reminder of past errors that had better be forgotten. But there are occasions when it is legitimate to remind ourselves and others that what we foretold has come to pass, and to suggest that such an experience of successful judgement is a good augury for a continuance of correctness of judgement in related subjects.

The first or interim report of the Voluntary Hospitals Commission provides a useful text on which to base a claim for correctness of judgement by the British Medical Association on the trend of hospital affairs. The Association gave evidence before the Cave Committee and put forward, amongst several propositions, (1) a definition of what is the characteristic feature of voluntary hospitals, and (2) a proposition as to how a Government subsidy could be given to such hospitals without jeopardizing the essential feature of such hospitals.

1. The Association stated that the feature of a voluntary hospital which was worthy of maintenance in all interests was its voluntary method of administration; and later this was put into shape as a clear definition, which is now the policy of the Association:

"The Association maintains that the essence of the voluntary hospital system is the independent and voluntary management, and that this is not necessarily related to the conditions of service of the medical staffs."

This, the first attempt at such a definition, was severely criticized by many, and with not a little attempt at ridicule that the Association should be so impudent as to attempt to propound a new definition of so old a word as "voluntary." Wisdom is justified of her children. For the Voluntary Hospitals Commission has arrived at a definition which is as nearly the same as two tongues can voice it. In par. 3 of their report the Commission say their first task was to determine what was a voluntary hospital, and state:

"We were clearly of opinion that voluntary management by a responsible committee was an essential condition."

Their readers are left in no doubt as to what they mean by "voluntary management"; it is shown on page 13 to be the antithesis of "Government and municipal control."

The supporters of "voluntary contributions" as the feature of voluntary hospitals may derive some small comfort from the fact that in deciding to which of the many voluntary hospitals the Commission should disburse their grants they limited their interest to those hospitals which are "wholly or mainly supported from voluntary sources" or endowments. Since these emergency grants were necessitated by abnormal conditions, it may be supposed that those voluntary hospitals which derived their funds mainly from patients paid for by various authorities would need no emergency grant, for they could vary their charges with the variations of money value.

It is noteworthy that in defining a voluntary hospital the Commission made no reference to the medical staff. This is an interesting negative commentary by the successors of the Cave Committee, which in its report published the *obiter dictum* of two (unnamed) witnesses who claimed that the "bottom" of the voluntary system was an unpaid medical staff, for did not these "two distinguished physicians" state that with a paid staff "the bottom would drop out of the voluntary system"? Apparently the Commission agreed with the Association, and did not find that the terms of service of the medical staff had any necessary relation to the voluntary hospital system, neither as bottom, top, sides, handles, nor even as a decorative feature.

2. The Association, in giving evidence before the Cave Committee, stated that in its opinion there was only one way in which the Government could subsidize the voluntary hospitals without jeopardizing that independence which was their characteristic feature. This was by handing over in bulk such sum as it proposed to disburse to some intermediary body which would allocate the funds as it deemed most fitting, and the Association cited as a precedent for this mode of action the University Grants Committee. That proposition was accepted by the Cave Committee—it became one of its recommendations to the Government, and was accepted and acted upon by the Government. The report of the Voluntary Hospitals Commission shows that this policy has worked well; early suspicions on the part of some boards of management of voluntary hospitals have been allayed by the evident good faith of the Commission and its local committees; they find that the work of these committees does not threaten their proper independence.

The Association made a great break with old and cherished traditions when it recognized that the voluntary hospitals had duties to perform other than those of charities for the treatment of the very poor. This is set out in the statement of policy, thus:

"The Association recognizes a dual policy as regards the voluntary hospitals: (*a*) that the purely charitable side should be continued wherein the whole cost of the maintenance of indigent patients is met by the gratuitous contributions received by the hospital and on whose behalf the services of the honorary medical staffs are given gratuitously; (*b*) that other patients who are not indigent may be received for treatment at voluntary hospitals when they cannot pay for or cannot obtain adequate treatment elsewhere and that for them payment should be received by the hospital either from the patients themselves or on their behalf from the authority or body referring them to the hospital, and that on account of their treatment some method of remuneration of the honorary medical staff should be arranged."

Strong confirmation of this judgement of the Association is to be found in the report of the Somerset Voluntary Hospitals Committee, which is the first of these local committee reports to hand. The report reads:

"In a country where hospitals come into existence haphazard . . . it is inevitable that the hospitals' position generally should disclose many defects, the most important of which seems to be the following [nine points are cited—of these I quote two]:

"(*e*) The lack of accommodation for patients of moderate means.

"(*i*) A too loyal adherence to the old tradition that hospitals are charitable institutions for the very poor, and the failure to give active recognition to the fact that the population wants a much better hospital service, open to all classes, and is willing to pay for it."

The satisfaction of a demand such as this will make the position of the medical staffs of the hospitals totally different from that which they willingly assumed in the old days when the hospitals were pure charities, and the policy of the Association requires the recognition of this change.

Again, the Association policy has given a clear lead in the matter of contributory schemes. Its standards of what should be found in such schemes deserve the close study of those interested in hospitals. And I learn that the more they are considered by hospital financiers the more they are found to give correct indications of policy. The report of the Voluntary Hospitals Commission states:

"Considerable progress has been made in organizing schemes of mass contribution, and this method of securing additional income has the hearty support of the Commission and the local committees. But very little definite information is yet available, and the Commission have issued a questionnaire to all local voluntary hospital committees asking for particulars of the methods adopted in their respective areas for the collection of income."

These schemes may prove of the greatest value in establishing the voluntary hospitals on a sure basis, or they may be destructive; which of these results is to come about will depend largely on the action of the medical staffs. If the staffs clearly insist that from the beginning these schemes are to be run in the best interests of the patients, the public, and of medical practice, then they will be genuinely self-supporting schemes by which both hospitals and patients will benefit; if they are regarded as merely devices to catch money without regard to sound principles they will bring discredit upon hospitals, engender irritation amongst the contributors, and breed suspicion between hospital boards and staffs, with resulting failure and possibly disaster to the voluntary system. There is urgent need in these matters for close co-operation between lay boards and medical staffs. Too often a board is so absorbed in making ends meet as to become greedy of money no matter how it comes, or how it may affect the medical staff, the mainstay of the hospital. So also with the local voluntary hospitals committees, there is need for more effective medical representation. This is recognized by the Somerset Committee, which suggests:

"That the local committees should be so constituted as to give to hospitals a fuller representation and to include a stronger expert element."

The moral of this letter in the "I told you so" form is to suggest that the Association, which has so well foreseen the problems which have confronted the new Commission and its local committees, is likely to be correct in its other anticipations, which indeed are based upon those which have already been tested and found to be true. I would therefore appeal with some confidence that those points of the Association policy which are as yet awaiting confirmation may be regarded as the necessary corollary of the changes in being, and that there should be given to the proposals of the Council for the next Representative Meeting a united support. I recognize the point of view of those who cling to old ideals, but I would suggest to them that in clinging too closely to the past they may endanger the future. The fascinating swaddling clothes of infancy are a trammel and a danger to lusty youth. There are some—I have heard their public statements—who declare that they will cling to and labour for a hospital that is a charity pure and simple, but that if change is to come let it come by sweeping all into a State hospital system with a fully paid staff. Such extreme utterances show a lack of vision, which does not agree with the versatility of Englishmen, who are accustomed to evolve measures suitable to changed conditions, rather than to plunge into the turmoil and destruction of revolution. The voluntary hospitals should continue to be charities in so far as charity is needed, but we must be glad that the need of charity is diminishing, and that there is now the greater need for these hospitals to provide for those who can with proper pride and self-respect pay their way. I believe that when this is done the voluntary hospitals will make a greater appeal than ever to the benevolent, and be more likely to swing the State hospitals into their own orbit of efficiency rather than to be swallowed up in a uniform State system.—I am, etc.,

London, W.1, March 3rd. N. BISHOP HARMAN.

SIR,—I would comment briefly on the letters of Dr. Fothergill and Dr. Fletcher in the issues of the JOURNAL for February 24th and March 3rd. The latter considers that the voluntary system is tottering to its fall. On the other hand, the Voluntary Hospitals Commission, with Lord Onslow as chairman, which has been most carefully studying this question for six months, has had every facility for its accurate investigation, and includes the Chairman of the Council of the British Medical Association, states in its interim report just published, that "the results of our investigation and experience during the period under review show conclusively that the voluntary system possesses strong vitality, and that its chances of permanent survival are increasingly hopeful." The Commission also produces evidence that Lord Cave's Committee, which nevertheless strongly affirmed their belief in the voluntary system, were quite unduly pessimistic in their estimate of the financial position of hospitals. It would be interesting to

learn on what information hidden from this special committee Dr. Fletcher bases his opinion.

With much contained in Dr. Fothergill's letters I find myself in agreement; but when he affirms that "The tariff of payments for 85 per cent." (of hospital patients) "should be such as to pay in full the whole cost to the hospital, including remuneration of the staff," I am amazed. Whence is this money to come, and what patients, save those few paid for by public bodies, and the small "private" class, can raise it directly or indirectly? The hospitals of Brighton, where he resides, are distinguished as the birthplace of a contributory scheme, largely advertised at one time both in the medical and lay press as about to introduce a financial millennium in the hospital world; yet a deficit of £15,000 at the Royal Sussex County Hospital has just been the subject of investigation by a special committee and of considerable comment in the local press. I can conceive nothing likely to militate more seriously against the success of appeals to the public to remedy by their charity this lamentable condition, which seems to be, in such serious dimensions, peculiar to Brighton among county hospitals, than the propagation of a notion that 85 per cent. of the patients are able, directly or indirectly, to pay their full cost and remunerate the staff as well. Who will subscribe if this be true?

In conclusion I would quote from Lord Onslow's Committee again: "Some 976 approved societies have agreed to devote a portion of their surpluses to payments in respect of the hospital treatment of their members, and schemes have been approved up to the next valuation results (five years)." These schemes will yield about £200,000 a year. Again: "Up to July only about £30,000 had been paid out, although a considerable sum of money had accrued. We think that the societies are genuinely anxious to facilitate the disbursement of the money to the hospitals." This statement from such authority will, I hope, finally dispose of that ridiculous bogy of "manipulation of funds," set up so prominently without a particle of evidence by the Council, which, like the grotesque suggestion of "token payments," seems to me to be patently but a last desperate effort by the Council and Hospitals Committee to save their face, in retreat from a position which surely they must now perceive was hopelessly untenable from the first. The Chairman of the Hospitals Committee has not, I believe, the support even of his own colleagues on his staff. Mr. Eccles assuredly lacks that of his. What the attitude of the London Hospital staff may be I know not, but if, which I doubt, they support Mr. Souttar, they must be almost unique among the teaching staffs of London, and in such case would not have the remotest chance with their chairman and lay board, in the extremely unlikely event of their approaching these laymen with their policy.—I am, etc.,

Chichester, March 3rd. G. C. GARRATT.

NAVAL HYGIENE.

SIR,—I observe that the Admiralty have appointed a committee "to deal with the accommodation required and available on H.M. ships and the complements that can be borne with the best possible advantage," and I note the marked absence on such committee of a representative of the Naval Medical (Sanitary) Department. Surely it would be in the direct and best interests of the service if an authority on naval hygiene were to have a place on such a committee when important factors in their deliberations—for example, cubic air space and ventilation—have to be considered.—I am, etc.,

February 26th. MEDICUS NAVALIS.

Obituary.

J. BEATTIE McFARLAND, M.D., M.CH., Lincoln.

WE regret to record the sudden death of Dr. Beattie McFarland of Lincoln, which occurred in the house of a patient on March 2nd. Dr. McFarland was born sixty-six years ago at Omagh, co. Tyrone, and received his medical education in Belfast; he graduated M.D. in 1881, and M.Ch. in 1883, of the Royal University of Ireland. After assistantships in Glasgow and Sheffield he went to Lincoln, where he built up a large general practice. For many years he held the post of medical officer to the Lincoln Workhouse and of one of the local union districts. During the whole of the war he was on the staff of the 4th Northern General Hospital, having attained the rank of major when he was demobilized.

Dr. McFarland had long been a pillar of the British Medical Association, of which he first became a member in 1886. He was the Representative of the Lincoln Division of the Midland Branch from 1910 to 1914, and from 1917 to 1922; he was vice-chairman of his Division in 1915, 1916, and 1919, and chairman in 1920. He was one of the best and most faithful of British Medical Association men, and his death is a great loss to the medical profession in Lincoln.

A colleague (G.J.R.L.) writes: Everybody liked Dr. Beattie McFarland—he was a friend to all. During the war his professional brethren naturally saw much of him and learned to appreciate his thorough-going earnestness and kindness of heart. He would do anything to help, and when things were at their busiest he was always cheerful and ready to take any duty that lay to his hand. For many years he was the Representative of the Lincoln Division in the Representative Body of the British Medical Association, and the Association had no more loyal adherent. Many times at meetings of the Division he would say, "The B.M.A. has decided so-and-so," or "The B.M.A. does not approve of this or that." He loved attending the Annual Meeting and greeting his old friends, and he always brought back something new in the way of ideas to his fellow members at home. He had been chairman of the Lincoln Panel Committee since the commencement, and took an intense interest in the working of the Insurance Acts. He was a pattern of what the "panel doctor" should be—always as kind, thoughtful and thorough over the case of the "panel patient" as over that of any of his more wealthy patients. The profession in Lincoln and indeed in the country is the poorer for his passing.

THE LATE DR. W. P. PURVIS.—We regret that in the obituary notice of the late Dr. William Prior Purvis (JOURNAL, March 3rd, 1923, p. 399) it was stated that he was born at Belize, British Honduras. Dr. Purvis, we are authoritatively informed, was born on March 18th, 1869, at Greenwich, the eldest child of Dr. J. P. Purvis of Greenwich, and grandson of Dr. Prior Purvis of Blackheath (who was amongst the first batch of M.D.'s of London University). Dr. W. P. Purvis was educated at Roan School, Greenwich, of which he was a distinguished pupil.

Universities and Colleges.

UNIVERSITY OF LONDON.

AT a meeting held on February 21st the Senate appointed Mr. H. J. Waring, M.S., F.R.C.S., to be its representative at the celebration of the 800th anniversary of St. Bartholomew's Hospital, in June, 1923; and Mr. Waring and (in respect of University College) Professor H. R. Kenwood, C.M.G., M.B., to be its representatives at the 34th Congress of the Royal Sanitary Institute, to be held at Hull in July-August, 1923.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

THE following supplementary list of candidates for the College licence who have conformed to the bye-laws and regulations, and passed the required examinations, will be proposed to the College for the granting of licences to practise physic:

H. C. Beccle, W. C. M. Berridge, F. Bishara, *Kathleen N. Blomfield, W. G. Booth, C. H. Budge, H. G. R. Canning, F. J. Clayton, G. S. W. de Saram, R. V. Facey, G. E. Fisher, S. L. Freedman, J. H. Gann, *Joan O. Geldard, R. M. Geldart, F. Guiver, P. G. Harvey, M. F. Ismail, H. Jackson, A. L. P. Jeffery, H. V. M. Jones, J. W. Joule, E. Joyston-Bechal, G. Klionsky, M. A. Lautre, L. B. Liebster, C. G. Lingford, *Barbara V. Lucas, J. A. Mackay-Ross, M. Markiles, R. G. Morrison, A. L. te W. Naudé, *Elizabeth M. Nicholson-Smith, *Judith E M. Ormerod, E. Orsmond, A. R. V. Patel, M. K. V. G. Pillai, *Mary F. R. Pitt, *Ethel B. Poole, T. P. Rees, *Emily V. Saunders-Jacobs, P. G. Sedgwick, I. I. A. Shaheed, G. D. Summers, S. E. Tanner, R. W. Taylor, *Blanchette Thomas, *Kathleen Tresilian.

* Under the Medical Act, 1876.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in:

Surgery.—M. Hawke, L. D. A. Hussey, C. M. John, *S. W. Turtle, A. Vasudev.

Medicine.—K. C. Chock, S. E. Hymans de Tiel, C. S. Laurence, *J. A. Marriott, O. F. W. Robinson, S. W. Turtle, A. Vasudev.

Forensic Medicine.—K. C. Chock, S. E. Hymans de Tiel, J. A. Marriott, O. F. W. Robinson, A. Vasudev.

Midwifery.—F. Bienaschewitsch, E. W. Hicks, J. A. H. Sykes.

* Section II.

The diploma of the Society, entitling them to practise Medicine, Surgery, and Midwifery, has been granted to Messrs. J. A. Marriott and S. W. Turtle.

Medico-Legal.

BIRTH CONTROL LIBEL ACTION.

STOPES v. SUTHERLAND AND ANOTHER.

AN action for damages for libel brought by Marie Charlotte Carmichael Stopes, wife of Humphrey Verdon Roe, against Halliday Gibson Sutherland and Harding and More, Ltd., was heard before the Lord Chief Justice and a special jury in the King's Bench Division, on February 21st, 22nd, 23rd, 27th, and 28th. Judgement was delivered on March 1st.

The plaintiff was described in the statement of claim as a doctor of science of the University of London, a Fellow of University College, and a doctor of philosophy of the University of Munich; president of the Society for Constructive Birth Control and Racial Progress, and one of the founders and controlling and responsible for the conduct of a charitable clinic for birth control at 61, Marlborough Road, Holloway, N.

Dr. Sutherland, a doctor of medicine and bachelor of surgery of the University of Edinburgh, wrote a book entitled *Birth Control: A Statement of Christian Doctrine against the Neo-Malthusians*, which was printed and published by Messrs. Harding and More towards the close of March, 1922. The passages complained of in this book (pp. 101–102) were as follows:

"*Exposing the Poor to Experiment.*

"Secondly, the ordinary decent instincts of the poor are against these practices, and indeed they have used them less than any other class. But, owing to their poverty, lack of learning, and helplessness, the poor are the natural victims of those who seek to make experiments on their fellows. In the midst of a London slum, a woman, who is a doctor of German philosophy (Munich), has opened a Birth Control Clinic, where working women are instructed in a method of contraception described by Professor McIlroy as 'the most harmful method of which I have had experience.' (Proceedings of the Medico-Legal Society, July 7th, 1921.)

* * * * * * *

"it is truly amazing that this monstrous campaign of birth control should be tolerated by the Home Secretary. Charles Bradlaugh was condemned to jail for a less serious crime."

The plaintiff alleged that by these words the defendants meant and were understood to mean that she (Dr. Stopes) was taking advantage of the ignorance of the poor to subject them to experiments of a most harmful and dangerous nature; that she was guilty of disgraceful, illegal, and criminal practices for which she should be punished by a term of imprisonment; and that she was a person with whom no decent or respectable persons should associate. Plaintiff (the statement of claim continued) had been thereby greatly injured in her credit, character and reputation, and in the way of her position of controller and organizer of the said clinic, and had been brought into public scandal, hatred, and contempt.

Dr. Sutherland in his defence maintained that the words complained of by the plaintiff were incorrectly set out in her statement of claim, and that material parts of the passage were omitted. He denied that the words did or could bear the meaning alleged by the plaintiff; in their natural meaning (he said) these words were true in substance and in fact—fair and bona fide comment, made and published without malice, on matters of public interest. Particulars were filed in support of this plea of justification and of fair comment.

Mr. Patrick Hastings, K.C., Sir Hugh Fraser, and Mr. H. Metcalfe, instructed by Messrs. Braby and Waller, of Dacre House, Arundel Street, Strand, appeared for the plaintiff; Mr. Ernest Charles, K.C., Mr. H. V. Rabagliati, and Mr. Harold Murphy, instructed by Messrs. Charles Russell and Co., of 37, Norfolk Street, Strand, appeared for Dr. Sutherland; Serjeant Sullivan, K.C., and Mr. T. Mathew, instructed by Messrs. Witham, Roskell, Munster, and Weld of 1, Gray's Inn Square, appeared for Messrs. Harding and More, Ltd.

The Plaintiff's Case.

Mr. Hastings, opening the plaintiff's case, said that although the alleged libel was an attack on Dr. Stopes's character, it was also an attack on her life work. She had devoted a great deal of time to promoting the theory and practice of what was known as birth control. Dr. Sutherland's book, which contained the libel, was largely concerned with advocating the views of the Roman Catholic Church, of which Dr. Sutherland was an ardent supporter. If Dr. Sutherland saw fit to criticize the plaintiff's works nobody could complain; but she was entitled to complain when a man in his position went out of his way to say that what she had done amounted in effect to a criminal offence. His book was directed against any system of birth control; she objected to his statement therein that her work was experimentation on poor people unable to protect themselves. She objected, too, to the words which suggested that she was a person probably of German origin who was foisting her opinions upon the poor. Counsel then reviewed his client's parentage, upbringing, and academic distinctions in this country, and touched on her unhappy first marriage, which was annulled at her suit, and the effect of that experience upon the direction of her scientific outlook. Of her works written for the furtherance of the propaganda of birth control the best known was perhaps *Married Love*. Her teaching was that the only chance of happiness for married people was to realize that marriage was intended to be a joy to both, and not a curse to either of them; they should have children at a time when these could be properly cared for. Large sums had been received from the sale of the book, but Dr. Stopes had a wealthy husband, and practically every penny had gone to support her clinic and the society of which she was president and various distinguished persons were vice-presidents. That book, remarked counsel, the defendants had described as an obscene and criminal publication.

The first witness for the plaintiff was Sir James Barr, M.D., consulting physician to the Liverpool Royal Infirmary. He said he was acquainted with the plaintiff's work and with the establishment of her clinic, and thought it was doing an enormous amount of good. Information which normally all wealthy people had at the present day should, he held, be given to the poor as well. So far as he understood them, the methods employed (the cap and the quinine pessary) were very effective and very safe. Sir James Barr added that he was not appearing in the capacity of a vice-president of the British Medical Association, because the Association had not expressed any opinion upon this matter; he was a vice-president of the Constructive Birth Control Society. In cross-examination he expressed the view that Dr. Stopes's *Married Love* and *Wise Parenthood* were more suited for the married than for the young, though he did not think it would be utterly demoralizing if these books, describing sexual acts and practices, came into the hands of young people. He agreed that the "gold pin" device, of which he had no experience, would be an abortifacient if inserted into the uterus of a pregnant woman. He did not agree that the occlusive or check pessary was a dangerous thing, even when adjusted by the patient herself. The essence of the clinic was teaching the use of the check pessary.

The plaintiff, Dr. Marie Stopes, giving evidence, referred to her academic career, scientific travels and researches, educational work, married life, and writings on birth control. She said that a total reduction in the birth rate formed no part of her campaign; she advocated a decrease of the birth rate at the wrong part and an increase at the right end of the social scale. The object of her society was to counteract the steady reduction of the birth rate among the thrifty and sound, and the reckless breeding among persons at the other end of the social scale. Her clinic was founded, as a part of the campaign and with her husband's assistance, in March, 1921, in order to reach in a helpful manner the overburdened working-class women who were ignorant of the knowledge contained in writings on the subject. Besides the midwife in charge there was a visiting doctor who saw patients at the clinic. There had been no experiments upon any persons, rich or poor.

In cross-examination by Mr. Charles, witness agreed that she was not a medical practitioner; she was a doctor of science. When Dr. Sutherland's book came out she wrote for a copy, and two or three weeks later her husband, as honorary secretary of the Birth Control Society, wrote inviting him to debate his views with them at the Essex Hall. Counsel read a review that appeared in the issue for May, 1922, of *Birth Control News*, the journal of Dr. Stopes's society:

"Dr. Sutherland's book will impose only on those who are more ignorant than he is. It is nicely calculated to encourage the biassed in their prejudices, for now, when speaking against birth control, they can say 'A doctor says so!' They will probably forget he is a *Roman Catholic* doctor. The omissions from the book are quite as remarkable as its lies. We could fill our columns in illustration of this, but space is too valuable."

Witness agreed that individual doctors had, in a scattered way, said the same sort of thing as Dr. Sutherland before he wrote that book. There was correspondence in the *British Medical Journal* in which a certain number of opponents published letters. She agreed also that very much worse things than the alleged libel had been said of her as a private individual by the "gutter press," in which term she included the *New Witness*. She knew there was a strong feeling both for and against contraception. Her book, *Wise Parenthood*, was described by her as "a practical sequel to *Married Love*." In the ninth edition she omitted a paragraph addressed to the "more careful women" on the "aesthetic" value of the gold pin (or wish bone) pessary, which appeared in the seventh edition, because she found that English doctors were not so familiar with contraceptive technique as American doctors. Later she said: "I have since writing my books been approached by hundreds of medical practitioners,

giving me advice, offering me knowledge; many, many of them offering me a share in business concerns if I would take up and advertise various instruments." She added that she had no personal experience of this gold pin. The method she especially recommended was the small occlusive pessary for the cervix, invented in 1881 by a medical man—the cervical cap which adhered by natural suction. To have had some sort of declaration attached to her books, to be signed by the purchaser, would in her opinion have been an incitement to prurience. Witness was next taken over a passage in *Married Love* dealing with the artificial impregnation of a married woman with the semen of a man not her husband. Lastly, Mr. Charles questioned her regarding a work by her entitled *A New Gospel to All People*, from which he quoted. In the course of a long cross-examination by Serjeant Sullivan the plaintiff said there were many passages in *Married Love* which it would be an outrage to read aloud—passages written to be read with the book complete, in solitude and with a thoughtful mind. Asked about Bradlaugh's pamphlet, *The Fruits of Philosophy*, written by Dr. Knowlton, plaintiff said she did not think it obscene, but undesirable. Asked if there was anything in that pamphlet approaching the passages to which counsel had drawn attention in her book, she answered that it was dealing with a different subject. In reply to his Lordship, she said she had not ascertained what the word "obscene" meant in a legal sense. The method of contraception taught in her books could not be used by a virgin. Harmful and misleading information on the subject had been circulating freely in this country since 1823.

Maud F. Hebbes, a certified midwife, said she had been employed at the plaintiff's clinic in Holloway Road since March 17th, 1921. During that time 1,700 women had visited her with regard to birth control; no experiments were made there and she had never received a complaint from any woman attending. If they were having babies too quickly she taught them how to adjust the check pessary over the cervix, having herself first made a simple examination. She might never see them again (this in reply to Mr. Charles).

Sir William Arbuthnot Lane, Bt., F.R.C.S., consulting surgeon to Guy's Hospital, and a vice-president of the plaintiff's society, said that in the course of his practice he had seen intense misery and distress entirely due to multiple pregnancies. When he got to know the work of Dr. Stopes he felt he had come across a real and intelligent philanthropist at last. He had read all her books but had never been to her clinic. Assuming cleanliness there was no danger in the measures advocated at plaintiff's clinic. He had advised numbers of women to use the occlusive pessary. During cross-examination Sir W. A. Lane suggested to Mr. Charles that the preface to *Married Love*, by one of the most distinguished of living physiologists (Professor Starling), expressed the opinion of the medical profession as he (Sir William) knew it. He did not know, however, whether Professor Starling was coming to give evidence; nor whether Lord Dawson (whom Mr. Hastings had mentioned) was coming to give evidence. An expert midwife knew as much as a doctor about applying a check pessary.

Mr. Harold Chapple, M.Ch., F.R.C.S., obstetric surgeon and gynaecologist to Guy's Hospital, said he was quite familiar with the work carried on at plaintiff's clinic, though he had not visited it; he approved of her works and the things she advocated. In his opinion, the ordinary check pessary, if used with average intelligence, could not be injurious; he had never seen it do any harm. In a perfect world all such cases would be dealt with individually by a doctor. So far as the gold pin was concerned he had no knowledge of it from practical experience. In reply to his Lordship, who asked: "Is it your view, most sincerely held, that it is desirable that the public generally should know about the use of a check pessary?" the witness answered: "Yes; this is a woman's problem, and in particular, it is a married woman's problem." In order to go into the whole problem, when giving instruction about sex, it was necessary to talk about check pessaries. Sex education and contraceptives could not be separated. Closely questioned about extracts from the plaintiff's works, Mr. Chapple insisted that the sense of a book was lost if isolated passages alone were taken from it.

Sir William Bayliss, F.R.S., professor of general physiology at University College, London, said he was a vice-president of the plaintiff's society, and saw nothing objectionable in any of her books, which served a most excellent purpose of instruction in matters of sexual relations. He had no personal knowledge of the clinic. He did not think there was any harm in teaching young people about the use of the check pessary; they would not be interested in it.

Dr. Meredith Young, M.O.H. for Cheshire, said he had read everything the plaintiff had ever written; and he adopted the words used by Mr. Chapple—that they were clean, well and beautifully written books with a high ideal. He considered the clinic extremely well and ably run. He could not see that any injury was to be apprehended from the use of the check pessary if employed in a proper manner by an ordinary intelligent person. In reply to Mr. Charles, he could not see that any harm could result from the widest possible circulation of books like these. He was closely questioned about artificial insemination, and about the gold pin. He admitted that if conception took place the effect of the pin would be to produce abortion. Re-examined, he had had experience of very similar things, but not actually of the gold pin; it could only be used under medical supervision.

Dr. Janie Lorimer Hawthorne said she worked very largely among women and children and acted as honorary consulting surgeon for the plaintiff's clinic. She thought the effect of the plaintiff's books would be to help people to understand the marriage relationship; in her experience lack of such knowledge led to great unhappiness. She found nothing at all objectionable in any part of *Married Love*. Cross-examined, she thought a qualified midwife was quite capable of advising and fitting a check pessary. She had very little experience of the gold pin and therefore would not advise its use. She did not attend the clinic very regularly—perhaps once a fortnight; at each visit she saw perhaps three or four patients; perhaps six patients in a week were sent on to see her from the clinic during the intervals between her visits. Dr. Hawthorne was taken very closely over a publication by the plaintiff, entitled *A Letter to Working Mothers*, but maintained in effect that young people could come to no harm from reading this or *Wise Parenthood*.

Dr. George Jones, giving evidence, warmly praised the plaintiff's books, her clinic, and the midwife employed by her. He was emphatic that no possible danger attached to the use of the check pessary: the whole thing was "pure moonshine and nonsense." About the gold pin, of which he admitted he knew very little, Dr. Jones was closely cross-examined. In regard to the references to artificial insemination witness said that all knowledge was interesting, filth or no filth. Counsel remarked that if that be the true doctrine it seemed a little absurd to have a law against obscene publications. Witness replied that that law had gone a good deal farther than it ought to have done, and probably it would be altered as time went on: Common Law was always growing.

The Right Hon. G. H. Roberts, formerly Minister of Labour, said he had lived with the poor all his life, and, because of his appreciation of Dr. Stopes's work, took the chair at her meeting in the Queen's Hall in May, 1921; he had not visited her clinic. Cross-examined, he saw no objection to passages in her works indicated by counsel; normal girls and young men should, he thought, be educated in these matters; but he had never posed as an authority on particular methods. All depended on how the books were written; a book should be read as a whole.

Case for the Defence.

Mr. Charles, opening the case on behalf of Dr. Sutherland, said that, however conducted, the plaintiff's campaign was dangerous, and as conducted in this case it was monstrous. Hence she must not object to strong criticism. Dr. Sutherland had criticized the campaign but not the campaigner, against whom he had no malice at all. Neither Bradlaugh nor his colleague, Annie Besant, had gone nearly as far as plaintiff in her books. Counsel argued that Dr. Stopes's principal book was not merely a physiological treatise: it contained pages of common erotic stuff.

Miss Louise McIlroy, M.D., professor of obstetrics and gynaecology at the Royal Free Hospital School of Medicine for Women, said she had been a specialist in diseases of women since 1898. In July, 1921, she read a paper before the Medico-Legal Society, and in reply to the discussion she had said that the check pessary was the most dangerous form of contraceptive she knew of. In her opinion the unrestrained use of contraceptives without medical advice was extremely bad. Insertion of the check pessary might induce sepsis. If it did not fit the cervix it would not serve its purpose, and if it fitted the cervix it was liable to close up natural or unhealthy secretions. The use of a condom or sheath was not harmful to women. In cross-examination by Mr. Hastings, Professor McIlroy reiterated that she had known cases in which a woman could not have a child because of the previous use of artificial contraceptives. She agreed that there was a very large difference of opinion, both within the medical profession and outside it, about the advisability of using contraceptives. She was not opposed to contraceptive methods in medical cases: she recommended them in certain cases. In advising she considered the individual patient. She thought the plaintiff was genuinely trying to deal with the problem, but was misguided in her methods. In reply to his Lordship she regarded the use of contraceptives as being at most the second best. Her experience of occlusion of the womb was large, but did not include any case of a woman who had worn a check pessary. In reply to Mr. Hastings's questions about *Married Love*, she knew of women who were made miserable by their marital relations, but she did not think writing could do any good. Apart from individual cases, she agreed that it was possible to deal satisfactorily with the problem as a whole, but only in simple scientific language, not in a sympathetic and romantic strain.

Dr. Halliday Sutherland then gave evidence. He was taken over his medical career and his experience of practice and research in civil life at home and abroad, and in the Royal Navy and Royal Air Force during the war. As a result of what he heard at the Medico-Legal Society meeting on July 7th, 1921, he decided to study birth control and write a book on it; this was because he thought it good to make known to the public certain arguments against artificial birth control. He was a Roman Catholic, but it was not at the behest of any Roman Catholic that he wrote this book. Mr. Charles then asked the witness about the subject-matter of his book, and his observation of various public notices of the plaintiff's works. His book was published on March 27th, 1922; Dr. Stopes had written for a copy on March 24th, and a few days later it was sent to her. Her husband wrote on April 12th inviting witness to debate his views with their society. He sent no reply to the invitation because he did not want to do anything to further advertise plaintiff's campaign. The writ of libel was issued on May 12th. By the words "exposing the poor to experiment" he referred to the indiscriminate distribution of knowledge of artificial contraceptives among the poor for the purpose of attempting to redistribute the birth rate, contrary to the law of Nature: he considered this a bad social experiment. Further, from a medical point of view, the advocacy of the occlusive check pessary was harmful. By the words "a doctor of German philosophy (Munich)" he wished to make it perfectly plain that plaintiff was not a doctor of medicine and had no scientific degree which qualified her by knowledge to teach these methods; moreover, he had in mind that underlying this movement was a philosophy of materialism, associated since the war in a loose popular way with German philosophy. By "monstrous campaign" he meant the whole campaign—press campaign, books, lectures, interviews, and the clinic—and his point of view was both medical and national. He had never spoken to Dr. Stopes and felt no sort of personal malice against her. His reference to Bradlaugh meant that the move ment should be stopped.

In the course of a long cross-examination by Mr. Hastings, Dr. Sutherland said he meant his book to be controversial. He claimed no gynaecological experience since 1907, but he had studied this question and written a book. Counsel read passages from witness's book and from a speech by Lord Dawson at the Church Congress, and witness said that what he had written about Lord Dawson's views was a piece of strong writing. He thought the question of the advisability and the disadvantages of contraceptives had been thrust upon the general public; the opinion of the British Medical Association, with which he agreed, was that the means of knowing of such things should be obtained through a doctor; indiscriminate broadcasting of that kind of knowledge would do no good. Teaching in regard to matters of sex should be individual, and children should, emphatically, not be told about contraceptives. He considered that Dr. Stopes in her writings on sex was most unfortunate, because these contained a nauseating mixture of physiology and emotion instead of the cold language of physiology; the good idea in *Married Love* (written with the very best intentions in the world) was absolutely spoilt by the unnecessary details that followed and by its indiscriminate distribution. He held the firm conviction that the poor were among the sanest people in this country in regard to sex. By indiscriminately spreading knowledge about contraceptives and starting a birth control clinic the plaintiff, in his view, had done a more serious thing than Charles Bradlaugh did. When he wrote to this effect in his book he knew the contents of the Bradlaugh pamphlet but had not read it. He recognized that plaintiff wished to restrict the population among the poor; he knew, too, that she wanted to get healthy children at the best times, but that could not be done. As to the word "experiments" he did not mean surgical experiments; but the fitting of poor women with the harmful check pessary was an experiment, and the whole thing was a social experiment. In re-examination witness said he had collected a great deal of literature on the subject before writing his book. Lord Dawson had made no complaint whatsoever about what he (Dr. Sutherland) wrote; he understood that Lord Dawson disapproved of the indiscriminate broadcasting of information about these contraceptives.

Dr. A. E. Giles, senior surgeon to the Chelsea Hospital for Women and consulting gynaecologist to the Prince of Wales's Hospital, Tottenham, said that the so-called check pessary (handed to him in court) was intended to cover up the cervix completely so as to close its orifice. Were the instructions given in *A Letter to Working Women* carried out effectually there might or might not be danger according to the woman's condition at the time; unhealthy secretions would tend to be drawn back into the system, with a chance of great inflammation. It was difficult to understand how a woman could fit this pessary properly for herself, and a nurse or midwife was certainly not capable of saying whether a woman ought to use it or not; it should only be fitted by a doctor who thought it safe and proper after satisfying himself there was no disease. The gold pin or wish-bone pessary was advertised by its makers as favouring conception; if conception occurred with it in place a miscarriage would be the almost certain result; it would be dangerous for a woman to wear it for any length of time, and it might affect her future fertility. Cross-examined, Dr. Giles said it would be very difficult for anyone not a doctor to apply the gold pin. In reply to the judge, he thought a skilled female abortionist could insert it, though she was likely to do very great damage thereby.

Dr. F. J. McCann, surgeon to the Samaritan Hospital for Women, maintained that the general effect of artificial contraceptives was contrary to the best interests of a woman's health. Assuming that the check pessary was properly placed and doing the work for which it was intended, there would be chronic uterine congestion with a subsequent impairment of fertility. To broadcast this device and the quinine pessary would be most injurious. The gold pin hindered but did not stop conception; it was a dangerous abortifacient; he had removed one which had been fifteen months in the cavity of the uterus, causing a discharge. Cross-examined, witness said he held a very strong view, on national grounds, against the use of contraceptives save for reasons of health—in the presence of disease. He was closely questioned regarding his personal experience of any women who had been injured in health by the use of a rubber check pessary, and he gave details of one case in which he attributed menorrhagia to congestion arising from this cause. In his view all contraceptive methods used by women were injurious.

Mrs. Mary Scharlieb, M.D., consulting gynaecologist to the Royal Free Hospital, and consulting surgeon to the New Hospital for Women, expressed the view that if the instructions and advice as to the check pessary given in *Wise Parenthood* were applied to women damage was likely to follow, because it would restrain the natural secretions, and lead to a mild continuous sepsis if retained *in situ*. She believed the gold pin to be exceedingly dangerous; it was not so much a bar to conception as an instrument likely to cause very early abortion; if retained for months (as the book said it might be) and the woman aborted, this was too likely to be a septic abortion. Cross-examined, Dr. Scharlieb had no doubt as to the plaintiff's sincerity and good intentions, but held that no useful work had been done by publishing these books; she had read them all and objected to them all. In writing a few lines introductory to *Wise Parenthood* she had said that she differed entirely from the author regarding the views expressed, and the author acknowledged her disagreement. In her view the enlightenment of the public was imperative, but this should be undertaken in perfectly simple non-provocative language; it should not be emotional, nor make any appeal to the passions. Re-examined about a letter she had written to plaintiff's publisher, she repeated her opinion that the encouragement of people to use artificial contraceptives was materialistic—a thing that grieved her.

Dr. Norman Haire, who attended on subpoena, said, in reply to Mr. Rabagliati, that he was an obstetric and gynaecological surgeon now practising in London. He held the post of honorary medical officer in charge of a welfare centre in Walworth, where, besides ordinary welfare work, birth control knowledge was given by a doctor to all married women who desired it. He had written on this subject. In 1921 he went to plaintiff's clinic and discussed the gold pin. After that he made further inquiries which led him to judge that the pin would be unreliable and dangerous. He wrote to her expressing admiration for her work and begging her not to recommend a thing that might be dangerous. He was strongly in favour of a medical man or woman conveying knowledge of contraceptives to all married women. Dr. Haire was cross-examined by Mr. Hastings as to his communications with plaintiff about patients; he might have said he would be pleased to see any further patients she cared to send, but he had in no way canvassed for patients. He still thought her books served a very useful purpose, though he did not agree with all her points of technique, and he disagreed very greatly with the *New Gospel to All Peoples*. He used to recommend and fit the check pessary in appropriate cases, but found that women could not reintroduce it properly, so he gave up advising it. He had seen cases in which harm had followed its use, but he could not say that this was due to its use.

Mrs. Agnes Savill, M.D., said she was a general physician dealing largely with electrical treatment, and in the course of her experience had seen two unmarried women, one aged 25 and the other 40, whose health had been adversely affected by reading *Married Love*. Cross-examined, she did not think the book could do harm to married people; but it was making a natural function like eating and drinking a high art; it made married people think too much about sexual details; it was like a gourmand with food.

Dr. William Ernest Falconar, physician to out-patients, Paddington Green Children's Hospital, said he disliked very much the contraceptives advocated by the plaintiff. At the end of last September a young woman brought him a gold pin, asking him to insert it, and handed him a copy of *Wise Parenthood*. Having examined the pin he pointed out the danger and refused to insert it; he regarded it, not as a contraceptive, but as an abortifacient.

Sir Maurice Abbot Anderson, M.B.—whose evidence was taken on commission, by reason of ill health—stated that, broadly speaking, he favoured some sort of contraceptive procedure up to a point, but not that which the plaintiff advocated.

This concluded the case for the defendant, no evidence being called on behalf of Messrs. Harding and More, publishers of the book. Serjeant Sullivan then addressed the jury for the publishers, Mr. Charles for Dr. Sutherland, and Mr. Hastings for the plaintiff.

The Summing Up.

In the course of his summing up the Lord Chief Justice pointed out that the plaintiff—a lady of remarkable ability—was bringing this action to recover damages for a particular piece of writing which she said was a libel upon her. The passage complained of was a particular passage, with some omissions, in one of the later chapters of a book purporting to be a general examination of the problem of what was called "birth control." His Lordship reminded the jury of certain dates. The plaintiff's two chief works were published in 1918, one in the spring, the other in the autumn. In March, 1921, she opened the clinic. A few months later Professor McIlroy addressed the Medico-Legal Society on some topics connected with birth control. Dr. Sutherland's book was published on March 27th, 1922. Plaintiff's husband wrote to Dr. Sutherland inviting him to take part in a public debate, and a review of the work appeared in plaintiff's paper on May 3rd. Then, without any further warning, no letter before action, no remonstrance, there came upon May 12th the writ in this action. The defendants in their defence admitted publication, but said that so far as concerned statements of fact in what was complained of, those were true statements; so far as concerned expression of opinion, that was fair comment. It was not denied here that the subject-matter of this discussion was matter of public interest. Where the plea "This is true" was put in, that plea must in the proper and reasonable sense cover all the allegations of fact. This did not mean that every little detail had to be established, but that the gist of the libel—the real sting—must be established. In regard to the defence of fair comment the question for the jury was not at all "Do you agree with the criticisms the defendant has written?" but rather "Could a fair-minded man holding a strong view, holding perhaps an obstinate view, holding perhaps a prejudiced view—could a fair-minded man have been capable of writing this?" But the foundation of the structure upon which fair comment was to be built must be a foundation of truth: "a man cannot invent things, call them facts, and then base comment which shall be fair upon them as if they were facts." Two ingredients were needed: true statement of fact; and, upon the statement of fact, comment which a reasonable fair-minded man might make, whether the jury agreed with him or profoundly disagreed with him.

Now in this case the phrase "birth control" had been used in many different senses: but some precision of thought was necessary. Nobody so far as this case was concerned disputed for a moment the wisdom of explaining in innocent helpful language to young persons of both sexes some of the mysteries and implications of sex. Once depart from this admitted truth and the region of controversy was entered. Controversy began with the question of what should be the method of making these truths known. In much of the evidence that had been given, the next step seemed to be taken by a kind of jump: because it was desirable that young people should be taught in an innocent and pure-minded fashion the truth about sexual matters, therefore it was important that they should be taught the truth about what were called contraceptives. The next step was a further jump: because contraceptives were desirable for some persons in some circumstances, therefore everybody should be taught about them. Then it became at the next step a duty to differentiate between contraceptives; and then they came down to the check pessary. So that, starting from the large general unobjectionable statement that somebody, speaking to one person in private, should instruct the young innocently upon the implications of sex, it became a sort of public duty to spread about on the widest possible scale, without discrimination of sex or age, or marriage or absence of marriage, the truth about the check pessary; and the check pessary, when that stage of the argument was reached, had become something like a talisman, a goal, or a standard—a panacea for social ills, both public and private. There obviously were those who held that view. But might there not be those who stoutly held the opposite view: who said that these were matters of great delicacy and difficulty, that contraceptives might be in some cases a deplorable necessity, but that this information ought not to be published broadcast to all and sundry, and that, if so published, great care should be taken with the language, tone, and manner employed? It might have occurred to the jury that if the whole object was to diffuse as widely as possible the important truth that with the help of a check pessary a man and a woman need never have a child—might not that information be put in words of two or three syllables on half a sheet of notepaper? Whatever might be the mischief of broadcasting such information, that mischief (said many of the witnesses) was greatly exaggerated when the information was conveyed in a romantic, emotional, rhetorical fashion. There being thus profound differences of opinion, was it not plain that these might with vigour and vehemence be expressed?

His Lordship next examined the general purpose and arrangement of the defendants' book and the extracts from it which had been made the subject of these proceedings. He completed the second extract by quoting the words omitted in the plaintiff's statement of claim. In its complete form the second part of the passage ran:

> "When we remember that millions are being spent by the Ministry of Health and by Local Authorities—on pure milk for necessitous expectant and nursing mothers, on Maternity Clinics to guard the health of mothers before and after childbirth, for the provision of skilled midwives and on Infant Welfare Centres—all for the single purpose of bringing healthy children into our midst, it is truly amazing that this monstrous campaign of birth control should be tolerated by the Home Secretary. Charles Bradlaugh was condemned to jail for a less serious crime."

His Lordship then discussed at some length the meanings put upon the word "experiment" by the plaintiff and by the defendants, and in this connexion reviewed the medical evidence regarding the "gold pin." He then touched on the other phrases alleged to be libellous, and noted the difference of opinion among the medical witnesses in regard to the check pessary. Coming to the closing words of the passage complained of, he observed that the plaintiff said these amounted to an accusation of crime, whereas the defendant said that what he meant was, "Here is the Home Secretary tolerating something which is really worse than that which in the case of Charles Bradlaugh was held to be a crime." Whether they thought these words imputed criminality or not, the jury ought not to draw an inference from the fact that there had been no prosecution with regard to the plaintiff's books. In the Bradlaugh case the charge was the publication of an obscene book. At this point his Lordship made some observations on the meaning of the word "obscene," and continued:

> Now what is said here? Dr. Sutherland says that this is as bad as the Bradlaugh pamphlet and worse; and he says that in two respects. You have passages, he says, in these books to which no parallel can be found in the pamphlet published by Mr. Bradlaugh—no parallel at all. Your attention has been directed to certain passages; I am not going to re-read them to you. I daresay you have taken the trouble to read, as I have done, other passages. But just consider. The argument is that these are books which may be exposed for public sale indiscriminately, in great quantities, in order to fulfil a mission. The mission is variously described at various points of the argument. The teaching about sex is mixed up with the teaching about contraceptives; the teaching about contraceptives is mixed up with other matter; but it is all said to have been done in pursuance of a mission.

Whatever view the jury took about that question, they might ask themselves what legitimate purpose could be fulfilled by the insertion in these books—to be read by married and unmarried, young and old, persons of both sexes—of passages that described certain matters relating to sexual intercourse and analysed others. The jury knew the passages, knew the context, knew the circulation of these books. Could they say that these fell short of being obscene publications?

Verdict and Judgement.

The jury, after considering their verdict for three hours and three-quarters, returned the following answers to the questions put to them by the Lord Chief Justice:

(1) Were the words complained of defamatory of the plaintiff?—Yes.
(2) Were they true in substance and in fact?—Yes.
(3) Were they fair comment?—No.
(4) Damages, if any?—£100.

Counsel for the plaintiff and for the defendants each formally claimed judgement for their clients, and on the following morning his Lordship heard argument on the legal effect of the findings of the jury. Sir Hugh Fraser maintained that plaintiff was entitled to judgement for £100. Mr. Charles submitted that on the answers to the first two questions the defendants were, by every rule of law, entitled to judgement; the plea of justification was a complete answer to the action; if the words were true, there was an end of the matter. Serjeant Sullivan argued that a plea of fair comment did not arise if a plea of justification was made good.

His Lordship, in giving judgement, said he always understood that it was a good defence in libel if the words complained of were true in substance and in fact. On the findings of the jury in this case there was no course open to him but to give judgement for the defendants.

Mr. Charles asked for costs and these were granted; his Lordship agreed also to Sir Hugh Fraser's request for a stay of execution on the usual undertaking.

The Services.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following officers of the R.A.M.C.(T.A.): Colonel F. W. Higgs, C.B.E., Major H. L. Gregory, Major S. R. Gibbs, M.C., and Major D. Shannon.

FOREIGN DECORATIONS.

THE following decorations and medals have been awarded by the Allies indicated for distinguished services rendered during the war 1914-19, and the King has given unrestricted permission for them to be worn:

By the President of the French Republic: *Médaille de la Reconnaissance Française en Argent*—Lieut.-Colonel John Miller, D.S.O., M.C., R.A.M.C.(T.F.).

By the King of Italy: *Order of St. Maurice and St. Lazarus*—Commander: Major-General Sir Foster R. Newland, K.C.M.G., C.B., retired pay; Officer: Colonel John Vincent Forrest, C.B., C.M.G., retired pay; Cavalier: Captain Thomas Douglas Inch, O.B.E., M.C., R.A.M.C. (R. of O.). *Order of the Crown of Italy*—Officer: Brevet Colonel Arthur Chopping, C.B., C.M.G., R.A.M.C.; Cavalier: Temporary Captain Ambrose Emerson, R.A.M.C.

Medical News.

THE Senatus Academicus of the University of Aberdeen proposes to confer the honorary degree of LL.D. on Sir George Henry Makins, G.C.M.G., C.B., consulting surgeon to St. Thomas's Hospital.

PROFESSOR G. ELLIOT SMITH, F.R.S., will give the foundation oration of the Union Society of University College, London, on Thursday, March 22nd, at 8.30 p.m.

THE Denison House Committee on Public Assistance is about to present a petition to the Prime Minister asking for information as to the growth of expenditure from rates and taxes on public assistance and for a commission of inquiry and control. The expenditure, which in 1890 was 25 millions, had risen in 1920 to 233 millions, excluding 93 millions for war pensions. The expenditure on education in 1920 was 72 millions.

THE Medical Women's Federation has arranged to hold a dinner in the Empire Rooms, Trocadero Restaurant, on Thursday, May 10th, at 7.30 for 8 p.m.

A MEETING of the Tuberculosis Society will be held in the Council House, Bristol, on Friday, March 16th, at 10 a.m. At the morning session, tuberculosis and pregnancy will be discussed by Professor Lyle Cummins and Dr. E. Ward; and reactions relating to tuberculosis by Drs. Henry Ellis and Campbell McClure. At the afternoon session, the physique of the phthisical will be discussed by Dr. H. de Carle Woodcock; difficulties in diagnosis by Drs. Halliday G. Sutherland, T. Nelson, and Richard Clarke; and the domiciliary treatment of osteo-articular tuberculosis by Dr. W. C. Rivers. On March 17th at 10 a.m. Dr. T. Nelson will demonstrate the results of treatment by artificial pneumothorax.

THE London County Council has hitherto employed a woman doctor to examine, under the direction of the medical examiner (Sir John Collie), all women candidates selected for appointment on the staff of the Council or as school nurses, and any women members of the staff who were required to undergo medical examination and desired to be seen by a woman doctor. Mrs. Dickinson Berry, who has held this appointment for some years, having resigned, it has been decided to appoint a panel consisting of three women doctors, so as to obviate the inconvenience from any one part-time woman doctor being not always available. The medical examiner, who will be responsible for their certificates, and under whose direction the examinations will be made, proposes to pay them not less than 75 per cent. of his fee in each case.

AN Act has been passed in Spain giving the Spanish Government powers to proceed with the ratification of the "Maternity Convention" adopted by the first international labour conference held at Washington, under the auspices of the League of Nations, in 1919. Under the terms of this convention a woman who works for her living is not allowed to work during the six weeks following confinement, and has the right to leave her work six weeks beforehand on production of a medical certificate. During this time she is paid benefits provided either out of public funds or by means of a system of insurance, and is also entitled to free medical attendance; if nursing her child she is allowed half an hour twice a day during working hours for this purpose. The same Act authorizes the Spanish Government to institute a compulsory maternity insurance system. The "Maternity Convention" has already been ratified by Italy, Bulgaria, Greece, and Rumania.

ON March 3rd, at the Medical Society's rooms, Bournemouth, the members of the Dorset and West Hants Branch of the British Medical Association presented Dr. Walter Asten with an illuminated address, an armchair, and a selection of books on the occasion of his leaving Bournemouth, as a mark of their appreciation of his services as honorary secretary of the Branch during the last four years.

ON Friday next, March 16th, Sir Leonard Rogers will read a paper at 4.30 p.m., before the Dominions and Colonies and Indian Sections of the Royal Society of Arts, on recent advances towards the solution of the leprosy problem. The chair will be taken by Earl Winterton, Under Secretary of State for India.

AT a meeting of the Medico-Legal Society on Tuesday, March 20th, Dr. H. A. Burridge, lecturer on forensic medicine and toxicology at King's College Hospital, will open a discussion on State effort to rescue drug victims, with special reference to the Dangerous Drugs Act. The meeting will be held at the house of the Medical Society, Chandos Street, Cavendish Square, at 8.30 p.m.

THE first regional centre of the campaign against cancer in France was inaugurated by M. Strauss, Minister of Hygiene, at Bordeaux, on February 12th. It has been organized in the medical electricity department at the St. Raphael annexe of the Bordeaux Faculty of Medicine, under the direction of Professor Bergonié.

AMONG the courses of lectures arranged by the National Health Society is one of six on infant and child welfare by Dr. Eric Pritchard; the first will be given on Friday, April 20th, at 5 p.m. Dr. Mary Scharlieb will give the second of two lectures (for women only) on venereal diseases on Thursday, March 15th, at 4.30 p.m. Full particulars can be obtained on application to the Secretary of the Society, 53, Berners Street, W.1.

WE regret to announce the death, on February 20th, of Sir Thomas Roddick, M.D., F.R.C.S., who was President of the British Medical Association when it held its Annual Meeting in Montreal in 1897.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

A MEDICAL man, aged 62, with high blood pressure and arteriosclerosis, who must not visit, seeks advice (1) as to the best locality to live in, and (2) the most suitable employment in order to make a living.

"J. R." asks whether the tetanus bacillus or its spores has ever been found in commercial milk, fluid or dried, and whether milkers and dairy workers are ever infected.

SEVERE REACTION TO MOSQUITO BITE.

"X" (who resides in Wiltshire) writes: A lady, aged 50, suffers severely whenever bitten by a mosquito; within a few hours there is considerable oedema of the part, and at the site of the puncture a large blister forms, about the size of a pigeon's egg, which breaks, leaving a raw surface, just as after a scald. As the neighbourhood is never free from stray mosquitos, the patient's susceptibility is becoming a serious matter, for whenever she is bitten on the leg she is compelled to lie up for several days until the oedema has gone and the blister has healed. While it is not practicable to protect her from occasional bites, "X" would be glad of suggestions as to how he may prevent these severe local reactions.

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Half page	10	0	0
Whole page	20	0	0

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ON
MAN'S POSTURE: ITS EVOLUTION AND DISORDERS.

GIVEN AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND
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[*Abstracts.*]

LECTURE I.—THEORIES CONCERNING THE EVOLUTION OF MAN'S POSTURE.

THE true story of how anatomists abandoned the belief that man's body was a special creation and became converted to the theory of evolution commences in 1809, the year of Darwin's birth—when England and France were striving for mastery in the Spanish peninsula. The new idea was born in Paris—not, as one might well expect, in the famous schools of human anatomy hid amongst the crowded streets on the south bank of the Seine, but in the Museum of Natural History, situated in the neighbouring Jardin des Plantes. Three officials of the Museum—Cuvier, the Professor of Comparative Anatomy, Geoffroy St. Hilaire, who had charge of the collection of Vertebrate animals, and Lamarck, who was responsible for the Invertebrata—were effecting, amidst war and political change, a complete revolution in man's conception of the animal kingdom.

In 1809 the magnificent Cuvier, then in his fortieth year, standing, so far as concerned the public eye, head and shoulders above his colleagues, was bringing together the material for his famous work on *Ossements Fossiles*, awakening men to the knowledge that boundless ages of teeming life had come and gone before the present era began. While Cuvier was thus unconsciously enlarging man's conception of the past, his colleague, Geoffroy St. Hilaire, somewhat Cuvier's junior in years, was seeking for the common plan or design on which the bodies of vertebrate animals were built, thus preparing the way for those who were to preach the doctrine of a common descent for all living things. Lamarck, the least favoured of the three in the estimation of the learned men of his time, was twenty-five years Cuvier's senior. In the hustings of contemporary science he could scarcely make his voice heard, but we now know he had probed deeper into the secrets of Nature than either of his two colleagues. All his life long he had been a retiring but systematic student of living things and of the conditions under which they live. He was already an old man—a man of 65—when in 1809 he published two small volumes under the title of *Philosophie Zoologique*, in which we see that this retiring pioneer, as a result of a half-century of patient study, had reached the conviction that all the living things to be found on the earth to-day were but the twigs of a common tree of life, whose branches, trunk, and root were buried deeply in the past ages of the world. It is in this work, written in the seclusion of the precincts of the Museum, away from dissecting-rooms, and during stirring years of war, that we find the first clear statement of the belief—now universally held by human anatomists—that man's posture of body has been evolved from one which was simian or ape-like.

LAMARCK'S THEORY.

To do Lamarck full justice it would be necessary to make lengthy extracts from those chapters which deal with the evolution of man, but the following quotation (vol. i, p. 349) will give a just estimate of the manner in which he explained the evolution of man's posture:

> "Indeed, if any race of primates (quadrumanes) whatsoever, particularly the more highly evolved of them, were to lose, either from force of circumstances or any other cause, the aptitude for tree climbing and of grasping the branches with their feet, as with their hands, for security of grip; and if the individuals of this race, for a series of generations, be obliged to use their feet only in walking, and cease using their hands as feet; then there is no doubt, from the evidence produced in the foregoing chapters, that these apes would finally be transformed into man (bimanes) and that the great toe would no longer be separated from the other toes like a thumb, the feet serving merely the purposes of progression."

From this passage we see that, in the first place, Lamarck supposed man to have been evolved from a chimpanzee-like anthropoid, for we know that of modern and living anthropoids he regarded the chimpanzee as "the more highly evolved." The gorilla, it may be mentioned here, was not discovered until 1847—eighteen years after Lamarck had been laid in his grave. In the second place we note that Lamarck regarded the erect posture as a result of the chimpanzee-like ancestor having abandoned an arboreal mode of life for one in the open country. In the third place we note that he held the belief—one which we still regard as unproven—that the progress made by one generation in accommodating itself to an erect posture would, age upon age, be transmitted to the next generation. He was fully alive to the fact that any anthropoid which had acquired the human mode of progression had gained an enormous advantage; it would no longer be confined to tracts of tropical jungle but would have the whole length and breadth of the earth open to it.

DARWIN'S THEORY.

Lamarck was a pioneer, but so far as concerns the evolution of man he did not induce a single anatomist of his own or of a succeeding generation to follow in his footsteps. We have to pass to the year 1871, when the *Descent of Man* was published, to find the first effective step in the development of our modern knowledge of man's evolution. The Philosophy of Zoology had remained sixty-three years in neglect, and Charles Darwin, who declared he had read and studied the book to no profit, was then 62 years of age. We turn at once to the *Descent of Man* to see what conception Darwin had formed concerning the evolution of the human posture. At page 76 of the first edition the following passage occurs, which contains an explicit statement of Darwin's explanation:

> "As soon as some ancient member (elsewhere defined as some species of anthropoid like the chimpanzee) in the great series of the Primates came to be less arboreal, owing to a change in its manner of procuring subsistence, or to a change in the surrounding conditions, its habitual manner of progression would have been modified, and thus it would be rendered more strictly quadrupedal or bipedal. . . . Man alone has become a biped; and we can, I think, partly see how he has come to assume his erect attitude, which forms one of his most conspicuous characters. . . . As the progenitors of man became more and more erect, with their hands and arms more and more modified for prehension and other purposes, with their feet and legs at the same time transformed for firm support and progression, endless other changes in structure would have become necessary. The pelvis would have to be broadened, the spine peculiarly curved, and the head fixed in an altered position, all which changes have been attained by man. . . . It is very difficult to decide how far these modifications are the result of *natural selection* and how far of *the inherited effects* of the increased use of certain parts, or of the action of one part on another. No doubt these means of change often co-operate."

When the explanations advanced by Lamarck and by Darwin are compared it is at once seen that, as regards the manner in which the human posture has been evolved, there is much in common. (1) Both supposed that man had been evolved from a chimpanzee-like anthropoid and in the course of evolution the anthropoid posture had become human. (2) Both agree that the transformation had been initiated by a change from an arboreal to a terrestrial mode of existence. (3) Both believed that the results of habit or of function, acquired by one generation, could be inherited by the next generation. Darwin, however, made important additions: (1) he applied the law of natural selection—the tendency for successful individuals to survive and prosper; (2) he recognized the action of sexual selection; (3) he perceived that there was a law of correlation of parts—an obscure mechanism by which a number of structures were modified together to suit some particular function of the body. We now realize—or rather begin to realize—that the development and modification of various systems of structures are regulated or influenced by various internal secretions or "hormones." Darwin's law of correlationship of parts is but an intelligent anticipation of the more recent discoveries of physiology. We expect that fuller knowledge will yield the key to many problems in the evolution of posture which are at present unexplained.

In their bald outlines the explanations given by Lamarck and by Darwin of how man came by his erect posture have much in common. Why was it that for sixty-two years the one was regarded as an idle curiosity, while in the course of ten short and strenuous years the other had spread into every anatomical workroom throughout the civilized world, revolutionizing the worker's point of view and endowing his labour with a new aim and a new zeal? Both *Philosophie Zoologique* and *Descent of Man* were founded on a lifetime of inquiry and observation, but Darwin conquered—as men always will conquer—because he permitted a masterly array of facts to tell their own story, while Lamarck always wished

to tell the story of his facts. However that may be, there is no doubt of the fact that the *Descent of Man* is the starting point of our modern knowledge of all that pertains to the origin and evolution of the human body. The student of history will also note the fact that neither Lamarck nor Darwin was a professional anatomist, and yet they did more to alter our conception of the human body than any professional anatomist of their time.

How the Theory Now Stands.

Much has happened in the fifty-two laborious years which followed the publication of the *Descent of Man*. The time has come, so it seems to me, for a fresh survey of our knowledge of all that relates to man's posture in order that we may ascertain how far it is now necessary to modify, extend, or amplify Darwin's explanation of its evolution. My aim in this lecture is to pass in brief review recent inquiries and investigations which throw fresh light on how, when, and where man came by his erect attitude. I have also another object in view—to show that the problems relating to the evolution of posture have a very direct bearing on medical and surgical practice; many of the obscure and distressing conditions which require treatment are in reality manifestations of a disturbance or derangement of the elaborate mechanism which regulates and maintains the remarkable posture of the human body.

EVIDENCE FROM FOSSIL REMAINS.

The fossil remains of man, so far as they have become known to us in recent years, do not provide any certain clue as to the date, place, or manner in which the human posture was evolved. We cannot say that any fossil form of man yet discovered shows a foot in a stage intermediate to that of anthropoid and man. The most important discovery for our present purpose is that made by Dr. Eugène Dubois during 1891 and 1892 when he was resident in Java. He discovered the remains of a strange and distinct genus of man, to which he gave the name of *Pithecanthropus erectus*. No part of the foot, leg, or trunk was found, only three teeth, the roof of the skull, and the left thigh bone. The thigh bone leaves us in no doubt as to the posture of body; it is human in all its characters; we cannot explain its characters unless we suppose that Pithecanthropus was human in posture and gait. The stratum in which the remains of Pithecanthropus were found belongs either to the beginning of the geological epoch which precedes the present—the Pleistocene—or to the end of the still older epoch—the Pliocene. We thus know for certain that the human posture was fully evolved at least before the beginning of the Pleistocene period. There are many reasons, however, for supposing that Pithecanthropus represents a persistence of a primitive type which had appeared long before the beginning of the Pleistocene; in size of brain we must regard him as representative of man at the beginning rather than at the end of the Pliocene period. The thigh bones show that the lower extremities were used as in us, but the characters of the skull are incompatible with the poise of head seen in modern man. In the fossil man of Java the head was hafted to the neck as we see in living anthropoids—so that the head is carried with a forward slouch.

In recent years we have greatly extended our knowledge of that peculiar and extinct type of human being now known as Neanderthal man. The bones of the foot, leg, and thigh all show certain features which manifest a closer resemblance to the corresponding parts of the gorilla than do the same bones in modern man. The head was set on the neck in a manner which clearly represents a modification of the anthropoidal fixation. The earliest trace of Neanderthal man so far discovered is the Heidelberg or Mauer mandible, which was found in 1907 by the late Professor Otto Schoetensack in a stratum belonging to the older deposits of the glacial or Pleistocene period. The Heidelberg mandible clearly belongs to a very primitive type of Neanderthal man; the more humanized type became extinct long before the close of the Pleistocene period, and apparently long after men of the modern type had come into existence. There thus persisted into the Pleistocene period a race or species of man in which the body was less perfectly adapted for holding the head and body erect than is the case with modern man. Yet in the Piltdown type of man, who, in a geological sense, was the contemporary of Pithecanthropus, the head was carried almost as in modern Europeans. The conformation of his mastoid process and the muscular impressions of his occipital bone leave us in no doubt as regards this matter. Thus in recent geological periods there have been races or types of mankind showing degrees in their adaptation to the posture and gait of modern man.

A survey, then, of our present knowledge of extinct forms of man permits us to make only a guarded statement as regards the date and manner of the evolution of our posture and gait. It is apparent that the adaptations which permitted the head to be balanced on the neck are comparatively late acquisitions; they appear to have been evolved since the commencement of the Pleistocene period. The lower limbs assumed a human form at a much earlier date. Pithecanthropus had a fully evolved human femur, and we must infer that the foot was equally human. If I am right in regarding Pithecanthropus as representative of mankind at the beginning rather than at the end of the Pliocene, then it is in the strata of an older period, at least the Miocene, perhaps the Oligocene, that we must look for those ancestral forms which will show us the anthropoid foot and leg assuming the characters which we regard as human. "We are far," says Darwin, "from knowing how long it was since man first diverged from the Catarrhine stock, but it may have occurred at an epoch as remote as the Eocene period." We see, then, that Darwin was prepared to find fossil remains showing changes in the foot and leg such as I have just mentioned in even earlier formations than the Oligocene.

EVIDENCE FROM THE ANATOMY OF ANTHROPOIDS.

Having thus surveyed the evidence afforded by the fossil remains of man I propose now to inquire how far our present knowledge of the structure and habits of man's nearest allies—the anthropoid apes—will assist us in solving the problems of human posture. Our knowledge of these allies, both living and extinct, has greatly extended since Lamarck and Darwin formulated their theories, and we realize that both of these great men grossly underestimated the complexity of the problem and failed to realize that the structural adaptations which made plantigrade progression possible for man were not sudden transformations produced for man's particular benefit, but had come into existence during the evolution of the anthropoid body. It is in the evolution of the early anthropoids that we have to seek for the rise and development of the chief postural modifications of man's body. This truth was brought home to me very forcibly over thirty years ago when, as a medical officer and naturalist attached to a mining company exploring the mineral wealth of the Malay Peninsula and of Siam, I was drawn into a study of the apes and monkeys living in the jungles of these countries. They were regions in which malaria was endemic, and I set out to ascertain if the apes of the jungle suffered as much from fever as did the people of the villages. There were in my neighbourhood wandering troops of three kinds of ape, all of about the same size—weighing from 15 to 20 lb.: (1) the gibbon, the smallest and by far the most primitive of anthropoid apes; (2) various species of Semnopithecus, best known by their Indian cousin—the langur or holy monkey; (3) various species of the macaque monkey. My attention was soon transferred from the primary object of my investigation to the remarkable anatomical features of the gibbon's spine and trunk; in their arrangement the bones and muscles of the gibbon were altogether human, while the same parts in the semnopitheque and macaque, which outwardly looked as if they might be cousins to the gibbon, were altogether different. It was then I realized that the history of many of man's postural adaptations had to be traced back to the evolution of the gibbonish or hylobatian body (Hylobates is the generic name for the gibbons). Nor was there any difficulty in ascertaining that these structural features of the gibbon's body were postural adaptations. In his flight from tree to tree the gibbon's manner of progression differs altogether from that of monkeys. It is true that before starting their flight the resting posture of gibbon and monkey is much the same; both sit in a semi-erect posture, resting on their ischial callosities. In progression the gibbon uses his long arms as the chief means of support and of propulsion; he leaps with his arms; the lower limbs are deftly used as accessory means of support or as the chief means when running along horizontal branches. The body is held, in all movements, upright to the plane of progression. The gibbon is *orthograde* in its gait, whereas his neighbours, the monkeys, are *pronograde;* as they passed from branch to branch, or from tree to tree, their bodies are held parallel to the plane of motion. The semnopitheque was a heavy jumper; in a forward leap the impetus came from the hinder limbs and loins; the hands and arms were used to clutch the branch on

which he lighted, but were never used in the hand-over-hand method which is habitual in the gibbon—a true trapeze athlete. These early observations convinced me that if we are to seek for the beginnings of human posture we must first unravel the history of the gibbons.

The Evidence Afforded by Gibbons.

In point of structure the gibbon occupies a central position among the higher form of primates. It is linked to the three surviving great anthropoid apes—the gorilla, chimpanzee, and orang; all of these show a greater degree of adaptation than the gibbon to the orthograde posture. We have also good reason for believing that they are later in date of evolution. The gibbon, when allowance is made for its postural modifications, stands out as the cousin of old-world monkeys; all of these are pronograde in their gait, but in some the arms are used and developed to a much greater degree than in others; this is particularly true of those forms in which the tail has become reduced in length and strength. We shall see that the development of the tail depends on posture and gait. The gibbon is also cousin to the higher forms of South American monkeys; in some points of structure it is more nearly allied to them than to the monkeys of Asia and of Africa. The higher new world apes, although essentially pronograde in their gait, show a specialization of their hinder limbs, and in many cases a peculiar use of their tails, in grasping and climbing. While in the evolution of the gibbon the upper limbs have been exploited as means of support and progression, the specialization of function in South American monkeys has been concentrated on the lower limbs—they are used for suspension rather than for support. The structural similarity which unites gibbons, old-world monkeys, and new-world monkeys is such that we must regard all three as arising from a common ancestral form, from which has arisen a series of postural types represented in the small anthropoids and monkeys of the old and of the new world. The chief problem in the evolution of the gibbon, as of man, is the discovery of the machinery which Nature employs to mould structural form to postural function; the nature of this machinery we shall consider later. Meantime, so far as concerns the group of primates to which man belongs we may safely say that the greatest structural revolution which marks the history of this group occurred with the evolution of the gibbon. It is to this ancient structural revolution that man owes the chief of his postural modifications.

THE ANTIQUITY OF THE ORTHOGRADE POSTURE.

All the evidence at our disposal points to an ancient origin for the small anthropoids of the hylobatian or gibbon type. Fossil remains of them have been found in the Pliocene and Miocene deposits of Europe, and so like are they to the corresponding parts of modern gibbons that we feel certain that in the living gibbon we are dealing with an ancient and conservative type which has come through long geological epochs almost unchanged. It is highly probable that the orthograde gibbon and its pronograde cousins of the old and new worlds began to be differentiated towards the end of the Eocene period. In the Eocene formations of North America and of Europe are found fossil remains of numerous primates, but all of those so far discovered are tarsioid in form—more generalized in structure than gibbons or monkeys. The common stock from which gibbon and monkey arose will probably prove to be an Eocene tarsioid. That the orthograde hylobatian type had been differentiated from the ancestral pronograde monkey type at an early period is proved by the discovery of the remains of fossil apes in the Oligocene deposits of Egypt, which in point of geological age are intermediate to the older Eocene and more recent Miocene formations. Amongst these Egyptian fossil remains, which were described by Professor Schlosser in 1910, was the left half of a mandible of a small and primitive form of gibbon. Whether or not this early gibbon possessed the orthograde posture we have as yet no certain means of telling, but there is good reason for presuming that it did.

THE TROGLODYTE OR GREAT ANTHROPOID STAGE.

The first or hylobatian stage in the evolution of man's posture came during a remote geological epoch, with the appearance of the small type of anthropoid ape now represented by the gibbon. The second stage came with the evolution of the great anthropoid apes; and because the chimpanzee is the most generalized surviving member of this group and in former times was given the generic name of Troglodytes, this stage in the evolution of man's posture may be named the "Troglodytian." All available evidence points to the great anthropoids as having been evolved from a small anthropoid ancestry. In bulk and strength of body man and the chimpanzee are nearly alike, but the male orang, and particularly the male gorilla, outstrip the strongest man in strength and weight of body. With the evolution of the great anthropoids from the small, the weight of the body undergoing then an eight- or twelve-fold increase, adaptations for the orthograde posture and gait were necessarily modified as well as strengthened. In none of the great anthropoids do the arms reach the high degree of specialization in structure and function to be seen in modern gibbons; none of them are pure brachiators as are gibbons. In the orangs, it is true, the arms are much more important and more developed than the legs for arboreal progression; in the gorilla the opposite has happened; the lower limbs are the more specialized. The chimpanzee holds an intermediate position, both limbs being developed to an equal degree, as was probably the case in early anthropoid forms. One other point deserves mention; in the gibbon, as in old-world monkeys, there are ischial callosities to serve as natural rests in the sitting posture; in the great anthropoids these callosities have disappeared. As in man, true rest is obtained by the great anthropoids only when the body is laid prone upon bed or tree scaffold.

Such scanty evidence as we now possess leads us to believe that the troglodytian, or second, phase in the evolution of man's posture, took place about the end of the Oligocene period or the beginning of the Miocene. We know of the fossil remains of at least six species of Dryopithecus, an anthropoid which was neither less nor more primitive than any of the surviving giant anthropoids. The earliest traces of Dryopithecus come from deposits belonging to the middle of the Miocene period; it will probably be found that the great or giant form of anthropoid is pre-Miocene in date of origin.

THE THIRD OR PLANTIGRADE PHASE.

We come now to the third phase in the evolution of man's posture—the *plantigrade* stage. The first, or hylobatian, stage came with the appearance of the gibbons; the second, or troglodytian, with the evolution of the great anthropoids; and the third, the really human stage with which we are now dealing, when the line leading on to man branched off from the great anthropoid stock. The structural changes which occurred in the third stage were confined almost entirely to the lower limbs. The knees and thighs became more extended and strengthened until the lower limbs came to appear as if they were a downward continuation of the trunk. The pelvis or fulcrum of the lower limbs, as also of the spinal column, was modified; the hip and knee joints became adapted to the new posture; the muscles and bones of the leg assumed a human form; and, above all, the foot was transformed. We shall see, however, that underneath all that is so peculiarly human in our lower limbs there still lurk numerous vestiges and arrangements which we can only explain by supposing that at one time all the parts had passed through a troglodytian stage in their evolution. In the third stage only minor alterations occurred in the structure of the trunk. The chief adaptations to fit the thorax and the abdomen to the erect posture had been nearly perfected before the third or plantigrade stage had commenced.

In which geological period the third stage was entered and the plantigrade posture evolved we cannot as yet fix with any degree of certainty. No fossil form has yet been found in which the lower limbs are in process of transformation. It is true that the lower limbs of Neanderthal man show minor anthropoid traits, but it is also true that the femur of Pithecanthropus is a fully developed human form. No one who accepts evolution as a working hypothesis will have any difficulty in regarding the three great anthropoids—the gorilla, the chimpanzee, and the orang—as divergent branches from the common giant stem. Seeing that man shares so many characters in common with these we are compelled, I think, to regard man as an aberrant branch from the troglodytian stock or stem, and it is therefore probable that the plantigrade posture was evolved as soon as the common giant stock began to break up into its various living and fossil forms. We know for certain that this stock was in existence before the middle of the Miocene period, and it is therefore prior to that very remote date, most likely about the beginning of the Miocene or end of the Oligocene—two or three millions of years ago at the lowest estimate—that the plantigrade posture began to be evolved.

THE MODERN THEORY OF MAN'S POSTURE.

Thus it will be seen that modern anatomists no longer regard the postural adaptations of the human body as the result of a transformation peculiar to man, as did Lamarck and Darwin. They regard man's gait and posture as the culmination of a series of evolutionary phases which are to be traced in the bodies of orthograde primates throughout the greater part of the Tertiary duration of the earth's history.

THE COMPLEXITY OF THE PROBLEM.

The great extension of our knowledge of the constitution and mechanism of the central nerve system, largely the outcome of the discoveries made by Sir Charles Sherrington during the past thirty years, has shown us that the evolution of the orthograde posture was a far more complex and difficult problem than the great pioneers had supposed. We know how complex and delicately adjusted are the nerve centres which carry out the spinal reflexes of even pronograde apes; with the elaboration of the orthograde posture all of these spinal centres must have undergone a structural elaboration as well as a functional adjustment. Further, the orthograde posture, even in its more primitive form, demands a higher degree of co-ordination of the reflex centres in the spinal cord—centres or clusters which extend from one end of the cord to the other; consequently the higher centres—the red nucleus and other cell masses of the mid-brain, which regulate the postural tone—and the cerebellum, which has so much to do with the "timing" of the spinal centres, must have undergone a high degree of elaboration and expansion. The elaboration of the centres for automatic control of the orthograde muscular system was accompanied by an expansion of the basal ganglia and cortical centres of the brain. During the evolution of the orthograde posture brain and body had to become modified in unison.

The researches of Dr. Leonard Hill have made us aware of the elaborate mechanism needed to regulate the arterial blood pressure when the posture of the body is changed. In the early pronograde primates the vasomotor postural mechanisms must have been already highly evolved, but it is clear that, with each step towards the plantigrade posture of man, there must have been further specializations in the reflex centres which control the distribution of blood and in the structures which support the weight of the blood mass. Further, we shall see that all the structures concerned in the mechanism of respiration underwent a change in form, function, and control. The evolution of the orthograde posture entailed a structural revolution in all parts and systems of the body, from the crown of the head to the soles of the feet.

THE MACHINERY OF STRUCTURAL EVOLUTION.

When we see that a change from the pronograde to the orthograde posture entails a modification of nearly every muscle of the body as well as of corresponding changes in the nerve centres which control them we have to seek an answer to this problem: By what evolutionary machinery does Nature bring about simultaneous and harmonious modifications in a thousand apparently independent units of structure? The explanation offered by Lamarck, and also to a certain extent by Darwin, was that in the animal body there exists a mechanism by which structural modification acquired by one generation as the result of use and habit can be passed on, in ever-increasing degree, from generation to generation. The existence of such a machinery for transmission is not only unproved, but for several reasons is highly improbable. Darwin observed that there was evidence of some controlling factor which correlated the growth of associated structures. The nature of the mechanism which regulates the development and growth of parts and so fits them for performing their function in a new way is becoming apparent bit by bit as we get to know more of the behaviour of animal tissues. Phagocytes are attracted to sources of infection by a chemotactic mechanism. Kappers of Amsterdam has demonstrated that groups of developing nerve cells migrate in swarms and arrange themselves at sites favourable for the reception of the stimuli with which they have to deal; to the mechanism involved he gives the name "neurobiotaxis." Cells removed from the body of an embryo and grown in artificial media exert a regulating influence on each other; in a sutured wound of the intestine epithelium seeks out epithelium, and muscle cells seek out muscle cells in the process of union. The testicle throws into the blood a hormone which stimulates and regulates the growth of a crop of structures. In acromegaly we see a structural transformation effected in all systems of the body. It is along such lines as these that we are to be guided to the adaptational machinery which Nature has employed in bringing about evolutionary changes in posture and in the creation of new types of animals. We are only beginning to realize the elaborate growth machinery which is at work in shaping the body of the embryo; the one thing we can be certain of is that this machinery is constituted, not on an anatomical, but on a physiological basis. Further, it is not a supernatural machinery but one which, given means, opportunity, and industry, the mind of man can study and determine.

The Goulstonian Lectures
ON
THE NATURE OF ARTERIO-SCLEROSIS.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON

BY

GEOFFREY EVANS, M.D.CANTAB., F.R.C.P.LOND.,

ASSISTANT DIRECTOR, MEDICAL UNIT, AND ASSISTANT PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL.

[*With Special Plate.*]

LECTURE I.*

In leaving £200 for the maintenance of these annual lectures, Dr. Theodore Goulston directed that a dead body should, if possible, be procured and two or more diseases treated of. Arterio-sclerosis, as it happens, fulfils both conditions, since it is largely based on *post-mortem* study and includes two or more diseases. It is too often depicted as a permanent pathological change, the final result of a process of arterial decay. There is a mark of finality about these structural changes in vessel walls due to the accidental circumstance of their being chiefly studied after death, due also in part to the degenerative changes being more obvious than the proliferative, and in part to arterio-sclerosis being more common in the old than the young; hence the discovery of these changes during life tends to be accepted as evidence of wear and tear significant of an irrevocable step towards the grave. It is my object to bring forward some facts that will give this slow process of arterial "decay" some vitality and life, for I think it can be shown to be a process of disease with an onset that as yet escapes clinical recognition, and a course in which arrest or recovery are commoner than death.

DEFINITION OF ARTERIO-SCLEROSIS.

The problem of arterio-sclerosis is faced at once by the difficulty of its definition. Osler[1] defined it as "a condition of thickening of the arterial coats, with degeneration, diffuse or circumscribed." This definition states the two essential criteria of arterio-sclerosis—namely, the new formation of tissue and the presence of degeneration; the word "thickening" is better than the word "hardening," which is often used, because it marks the new formation of tissue. Forms of both acute and chronic arterial disease with thickening of the arterial coats but without degenerative lesions are excluded by definition from arterio-sclerosis. Thus periarteritis nodosa, thrombo-angeitis obliterans of Leo Buerger,[17] intimal thickening in ligatured vessels, and the endarteritis of Friedländer,[18] in all of which thickening of the walls occurs characteristically without degenerative change, are excluded from arterio-sclerosis.

The definition, however, makes no reference to the nature of the underlying process nor to the problem of causation, and it is therefore too inclusive. In their definition of arterio-sclerosis Thorel[2] and Marchand[3] take into account the underlying process, and in addition to emphasizing the importance of intimal thickening refer to "degenerative changes, inflammatory and productive processes" (Marchand), while Thorel speaks of "hyperplastic changes, and perhaps also inflammatory proliferation." In the second place, arterial lesions whose causation is known, even if they show both thickening and degeneration, do not belong to arterio-sclerosis, but are placed under their specific title. Thus syphilitic mesaortitis, and syphilitic and tuberculous endarteritis do not belong to the group of arterio-sclerosis, though syphilis may have to be taken into account as a factor in the causation of arterio-sclerosis when the anatomical lesion is that of arterio-sclerosis and the possibility of its being syphilitic is suspected but not assured.

* Abstract of lecture delivered on March 6th.

THE PROBLEM OF ARTERIO-SCLEROSIS.

As Sir Clifford Allbutt[4] has often insisted, arterio-sclerosis is not a disease. The word should only be used in a pathological sense to define a lesion which is common to many diseases. There are three distinct aspects of the problem—namely, the description of the vascular lesion, the relative importance in the production of this lesion of various pathological and physiological processes, and lastly its causation. There is fair measure of agreement as to the description of the lesion; there is, however, no accepted opinion as to the nature of the processes concerned in its production, and its causation is largely hypothetical.

CLASSIFICATION OF ARTERIO-SCLEROSIS.

Arterio-sclerosis is too large a subject to be considered as a whole in detail. It is conveniently divided into four main types based on anatomical changes—namely, nodular, diffuse hyperplastic, senile, and Mönckeberg's sclerosis.[5] This is Councilman's classification[6] with the addition of Mönckeberg's sclerosis. The classification of arterio-sclerosis is fully discussed by Sir Frederick Andrewes,[7] but I have not followed his classification, since several forms of arterial disease, such as syphilitic mesaortitis and arteries undergoing involution, which he includes under the term "arterio-sclerosis," are excluded by definition from this review.

At the same time the four main forms of arterio-sclerosis mentioned do not include all varieties of arterio-sclerosis commonly met with. There are among others more or less mixed forms that must be placed in the class to which the more prominent lesions belong, and there are forms of diffuse intimal thickening, particularly in the aorta and larger vessels, which are fibrotic rather than hyperplastic, and which seem to undergo fatty degeneration at an early stage in their evolution. For the present I am chiefly concerned with the type of arterio-sclerosis termed "diffuse hyperplastic sclerosis,"[5 16 22] and its relation to the other three types of arterio-sclerosis will be considered later.

DIFFUSE HYPERPLASTIC SCLEROSIS.

This type of arterial disease is the same as that termed "diffuse arterio-sclerosis" by Osler, "secondary arterio-sclerosis" by Thoma,[9] and "arterio-capillary fibrosis" by Gull and Sutton.[10] It is found in children[11] with renal disease and in adults with chronic nephritis (chronic parenchymatous nephritis) and true chronic interstitial nephritis,[8] also (as will be discussed later) in association with left ventricle hypertrophy and raised blood pressure, and lastly, in certain cases as an incident when death has resulted from some other not related cause. My observations on the histology of the lesion are based on the opinion that the nature of the arterial lesion and its evolution is the same in these different conditions and diseases, excepting that in the case of chronic nephritis it may be limited in its distribution and may indeed exceptionally be limited to the kidneys. The histology of diffuse hyperplastic sclerosis was the subject of controversy between Johnson and Gull, but Jores has made the greatest contribution to our knowledge of the lesion.[13 14] Aschoff and Gaskell[16] have followed np his work, and I have used the latter's method of gelatin imbedding in all my material for microscopic examination.[15] A short résumé of the main features of the lesion as previously described in detail[8] will now be given, with the addition of the description of the earliest stage of the lesion which I have not previously published.

The Histology of Diffuse Hyperplastic Sclerosis.

The essential lesion is a thickening of the intima in the smaller and smallest arteries. This observation is in complete agreement with Jores, and there can no longer be doubt on the matter. Reference will be made later to some observations on the histology and physiology of capillaries, and it will perhaps be shown in the future with more perfect histological technique that the earliest and most important changes are in the capillary endothelium. The intimal thickening is very uniform in the circumference of the vessel, and it may be so great as completely to occlude the lumen in the terminal arterioles, while the lumen of the parent arteries is often greatly reduced. In serial sections of kidney tissue the intimal change is fairly uniform in the length of the vessel both as regards the terminal arterioles and their parent vessels. There is no fatty degeneration in the small arteries, whereas in the arterioles there is marked fatty degeneration of the swollen intima. In a cross-section of the arteriole stained with Sudan 3 the lumen may appear completely filled with a plug of fat, or lying a little eccentrically may be seen a rosette of nuclei, the remnant of degenerated endothelial cells.

All vessels in a single organ are by no means equally affected. In slight or early cases the affection is limited to occasional vessels. When only occasional arterioles are affected, even when the lesion is complete and the arteriole lumen appears to be completely occluded with a plug of fat, the term "diffuse hyperplastic sclerosis" is not of course applied to the condition. For example, in the case of an apparently healthy young man, aged 19, who was killed by accident, I found two arterioles in the spleen in this condition; the rest of his cardio-vasculo-renal system was perfectly normal. The lesion is regarded as one of diffuse hyperplastic sclerosis when both arterioles and their parent vessels are affected, and as a rule it is found that the lesion in the parent vessels is more uniform, though it varies in degree, than in the terminal vessels. The changes found in capillaries will be considered later in discussing nephritis; their walls undergo hyaline swelling and focal fatty degeneration, the lumen becomes occluded, and they become empty of blood.

The intimal lesion in diffuse hyperplastic sclerosis is the structural change by which this form of arterio-sclerosis is recognized. Its chief incidence is on the finer ramifications of the vascular system, the terminal arteries and their parent vessels being chiefly or only affected; when the arteries from which the so-called parent arteries are given off are affected, they show similar changes to those seen in the parent arteries, while the intima of vessels of the size of the renal and radial artery is fairly normal in appearance. I have not identified a characteristic change in the larger vessels such as the aorta and its branches apart from the medial hypertrophy which is apparently present in marked cases of diffuse hyperplastic sclerosis associated with a raised blood pressure and left ventricle hypertrophy. In some cases the larger arteries show structural changes characteristic of nodular or senile arterio-sclerosis.

The distribution of the lesion in the several organs of the body shows considerable uniformity. The kidney and spleen are most commonly affected; so far as I have observed the spleen is not affected independently of the kidney, but since there are occasional cases in which the kidney is affected without the spleen being involved, it follows that of the two organs the kidney is rather more often affected than the spleen. The incidence of the lesion in the splenic vessels is a criterion of its general incidence in other organs, the kidney affection being a less reliable criterion because of the association of the vascular lesion with chronic nephritis. The brain appears, from my observations, to be the next organ most liable to this vascular lesion; and after this come the pancreas, liver, suprarenal glands, and, less often, the vessels of the stomach and intestines. I have seen no specimen in which the lesion was present in the heart; 70 cases have been examined, including many in which the lesion was well developed in other organs, hence it follows that its presence in the heart vasculature must be uncommon. The lesion has not been found in skeletal muscle. Other organs have been examined, and the lesion has been found in lymphatic glands and in one case in the ovaries; no example of the lesion has been found in skin, pituitary, thymus, urinary bladder, prostate, or uterus, but too few specimens have been examined to lend weight to the absence of the lesion in these organs.

Nature of the Intimal Thickening.

The sequence of changes that take place in the thickening of the intima cannot be determined by the investigation of the condition of the vessels in a single subject, and it is of course an assumption to describe as occurring in a sequence the various changes observed in different vessels in organs taken from different subjects; at the same time I believe that the changes in the arterial wall occur in the order that I now intend to describe. The first change to occur in the arterioles is a swelling and proliferation of the endothelial cells (Fig. 1). The new endothelial cells become flattened and undergo hyaline swelling, and the next stage in the process is the appearance of fatty granules in the cells (Fig. 2). The stainable fat increases, the granules coalesce, the cell outline is lost, and finally the cell protoplasm is replaced by fat. It is at this stage that the arteriole is frequently seen in cross-section with its lumen plugged with fat and the nuclei forming a tiny rosette in the centre. Ultimately the nuclei disintegrate and disappear, and the last cells to survive are those

nearest to the lumen, perhaps because they are the youngest, most recently formed cells, and because of their situation have the best supply of oxygen. In serial sections of arterioles parts that have undergone hyaline swelling merge insensibly into areas, or rather lengths of fatty degeneration; there is also a variation in the amount of Sudan 3 taken up, and its colour varies between yellow and vermilion red. When the arteriole is traced into the vessel from which it springs the fatty degeneration is seen to stop short at the wall of the parent vessel. This vessel characteristically contains no fat within its walls, and is in this in striking contrast to the fatty degeneration in the terminal arteriole.

Changes in the Parent Vessels.

The thickened intima of the parent vessels—a thickening which may be so marked as nearly to obliterate the lumen—consists of cells, fibrils of connective tissue and elastic tissue, and hyaline intercellular substance. The prominent feature of the thickened intima is the amount of hyaline substance present, the new formation of connective tissue, and the fine fibrils of elastic tissue that permeate the whole coat. In active and early lesions there is a considerable increase in the number of cells present, but more often there is a relative paucity of cells, though allowing for the great increase in the thickness of the intima there is even in these cases an increase in the number of cells over those present in the normal intima.

1. *Cellular Proliferation.*—Endothelial proliferation is more difficult to demonstrate in the parent vessels than in the arterioles, but there is no doubt of its occurrence. Fig. 3 shows an active stage of endothelial proliferation in a vessel taken from a section of a kidney with chronic nephritis. Fig. 5 shows a later stage, an appearance more frequently seen; the inner layers of cells are flattened endothelial cells, and they are seen lining the lumen in a close-up view of the same artery shown in Fig. 6. It is probable that some of the cells in the thickened intima arise by proliferation of the subendothelial cells.

2. *Origin of Elastic Fibres.*—Elastic fibrils are laid down by cells morphologically identical with connective tissue cells,[22] and in addition to this method of formation it has been suggested by Jores that the elastic tissue of the hyperplastic layer arises by a process of growth and splitting of the internal elastic lamina. The appearance of some sections of diseased arteries suggests the possibility of elastic fibrils being laid down directly by endothelial cells. In a case of endarteritis obliterans (type of Winiwarter) affecting the anterior tibial artery there was great thickening of the intima arising suddenly, almost like a shelf, in the lumen of the vessel. The thickened intima was enormously cellular and the cells had the appearance of flattened endothelial cells, in between which were found fibrils of elastic tissue almost enfolding the cells in their meshes. At one place the endothelial cells were arranged in a number of concentric layers enclosing a lumen, and near the lumen of this vessel, which seemed to be in the process of formation *in situ*, was a thick folded layer of elastic tissue, and lying flat on it, almost like slugs on celery, were endothelial cells.

3. *Origin of Hyaline Substance.*—The formation of hyaline is not without doubt a degenerative process. Adami[19] uses the word "inflammation" as reaction following injury, and the response to it. For the sake of clearness for my present purpose I would add the words "and to the effects of it." In distinction from a process of inflammation a process of degeneration is one in which there is no reaction on the part of the affected tissues to the change in their environment, the changes observed being a passive result of the alteration in environment, and the later phases of these changes are loss of function and cell death. I apply the term "degeneration" when fat appears in cells that do not normally contain it. Thus if an intimal cell contains fat it is regarded as undergoing the process of degeneration, whereas, of course, the appearance of fat in a liver cell has no such significance. It is agreed that the appearance of amyloid and calcification is evidence of degeneration. It is with the interpretation of the earlier phases of the process of degeneration that the difficulties occur. Thus it seems that cloudy swelling and a hyaline change may be either inflammatory in the sense that I have defined the word (that is, in its widest sense) or degenerative. Hyaline change is indeed commonly classed among the processes of degeneration in textbooks of pathology, and is in fact referred to as hyaline degeneration. In many instances the origin of the hyaline material is difficult to determine, in other cases there is little doubt as to its origin. Thus masses of fibrinous deposit may become hyaline, as may blood coagula in the thrombi of aneurysms, and similarly the thrombi of any vessel may undergo hyaline change. The hyaline change occurring under these circumstances is regarded as a degenerative change, and the clearest example is the change of dead protoplasm washed with tissue fluids to hyaline material.[20] Hyaline material appears also to be derived directly from cells, either as a secretion by glandular epithelium or as an accumulation of hyaline substances in the protoplasm of the cells. It is probable that the hyaline in the intima of the thickened arteries now under discussion arises in this way by a process of secretion by the endothelial cells or by the subendothelial cells. The coincident appearance of hyaline substance and cellular proliferation, the fact that the change does not progress to fatty degeneration, and lastly, the clear outline of the cells in the thickened intima and the good staining of their nuclei, are reasons for refusing to accept the presence of hyaline substance as evidence of a degenerative change. This point of view is clearly stated by J. Lorrain Smith, who writes:

> "Hyaline material is deposited in the walls of capillaries, causing thickening and gradually leading to closure of the lumen with atrophy and disappearance of the endothelial cells. This change in the capillaries is seen in senile conditions, and also in chronic inflammation, where it extends beyond the vessel to newly formed connective-tissue fibrils. In these examples it originates chiefly in the endothelium and may be regarded as secretory in form."

4. *Origin of Connective Tissues.*—The question of a degenerative process being involved in the formation of the fine connective tissue fibrils that permeate the thickened intima in diffuse hyperplastic sclerosis does not arise. There is no doubt that the process involved is one of inflammation in the sense in which that word has already been defined; in fact, the definition need not be so wide, and the word in this connexion can be used in the limited sense of "reaction following injury and the response to it." As has already been seen, there is no necessity for regarding the hyaline substance as a degenerative change, and therefore there is no need to explain the formation of connective tissue as an effect of the presence of hyaline substance. It is generally held that the connective tissue which often forms an appreciable part of the intima thickening is derived from the subendothelial cells which by their proliferation contribute to the cell increase in the thickened intima. In addition to its origin from these cells it is possible that some of the connective tissue is derived from endothelium. Thus Baumgarten has made observations that indicate the origin of fibroblasts and connective tissue from vascular endothelium under mild grades of irritation. Sir Bernard Spilsbury allows me to quote his observation of the appearance of connective tissue fibrils immediately under the growing layer of endothelial cells as they spread over a newly formed thrombus on a heart valve; in this latter case there were no cells in the neighbourhood from which the connective tissue could have been derived other than the endothelium.

Summary and Discussion of Changes in Intima, Media, and Adventitia.

Joseph Coats[21] maintained that the essential constituent of blood vessels is the intima. The endothelium is the universal lining of the vascular system; every vessel, in fact, has an intima, but only the arteries and veins have a media and adventitia; also in the formation of new vessels the primary event is the formation of a tube composed of endothelium by a process of budding from existing vessels. The paramount importance of the intima in health is maintained in disease, and I believe that the endothelial changes are the key to the interpretation of the lesion in diffuse hyperplastic sclerosis. It may be possible in the future to be more explicit in this statement and to bring forward convincing evidence that the endothelium plays the greater part in the intimal change. Thus specimens have been shown in which there is active proliferation of the endothelium; evidence has been brought forward that raises the question of elastic tissue formation by endothelium; the formation of hyaline material by a process of secretion from endothelium has been discussed; and finally, the formation of connective tissue by endothelial cells may be accepted as a fact. In short, the various constituents of the thickened intima in diffuse hyperplastic sclerosis, the proliferation of cells, the increase of elastic tissue, the formation of connective tissue, and the production of hyaline substance,

FIG. 1.—A terminal arteriole showing proliferation and swelling of endothelial cells; the lumen is almost obliterated and is occupied by a mononuclear cell. The earliest stage of diffuse hyperplastic sclerosis.

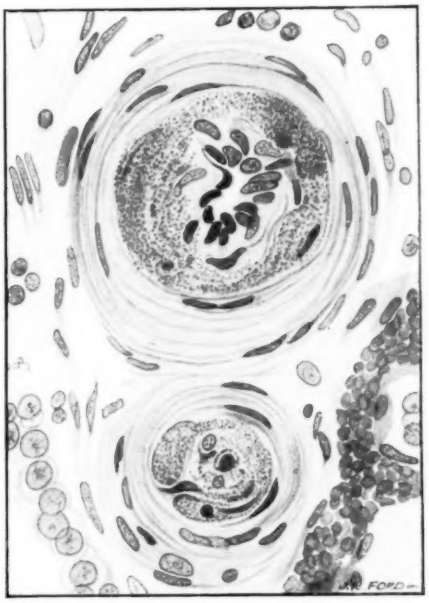

FIG. 2.—A later stage of the lesion, showing an arteriole with proliferated endothelium, the outer cells having undergone hyaline swelling and fatty degeneration (shown by black dots, section stained with Sudan 3), with loss of cell outline. The lower arteriole shows a still later stage, in which the lumen is completely obliterated and the cells further degenerated. The media is intact in each arteriole.

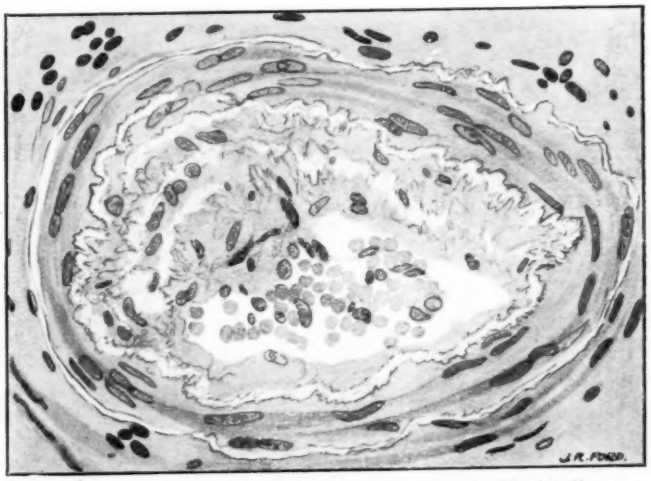

FIG. 3.—Endothelial proliferation in a parent vessel with simultaneous formation of elastic tissue. No fatty degeneration present. Early stage of lesion.

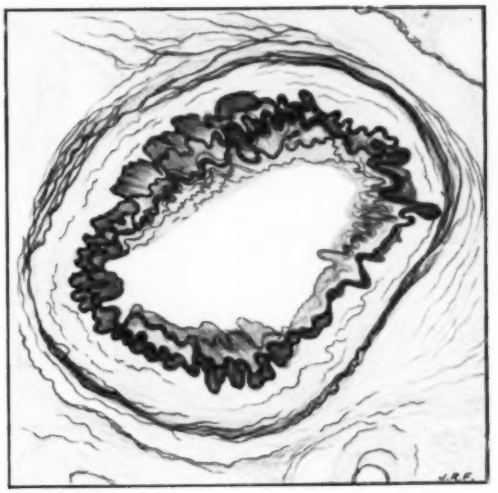

FIG. 4.—Same vessel as Fig. 3, stained with Weigert's elastic stain to show new formation of elastic tissue.

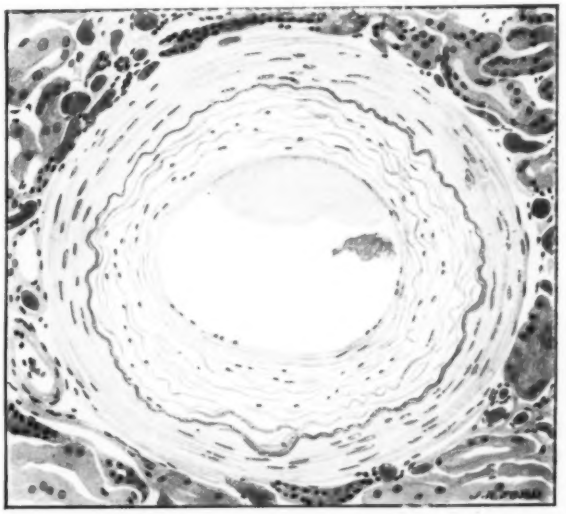

FIG. 5.—A later stage of the same process. The endothelial cells are now flattened; the new-formed elastic tissue is more regularly disposed.

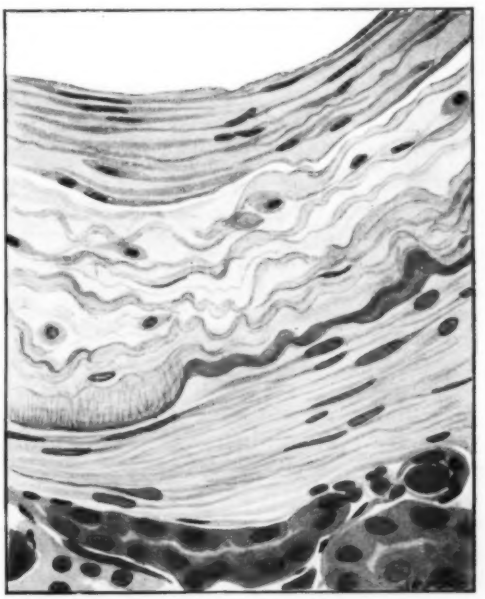

FIG. 6.—Close-up view of part of wall of same vessel to show the flattened endothelial cells, the new-formed elastic layers, the internal elastic lamina, the media, and surrounding kidney tissue in this order from above downwards.

FIG. 1.—The "Thames" prehistoric trephined skull. (London Museum.)

FIG. 2.—Experiment showing method of scraping skull.

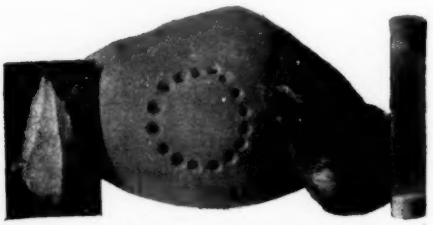

FIG. 3.—Boring and sawing by hand borers.

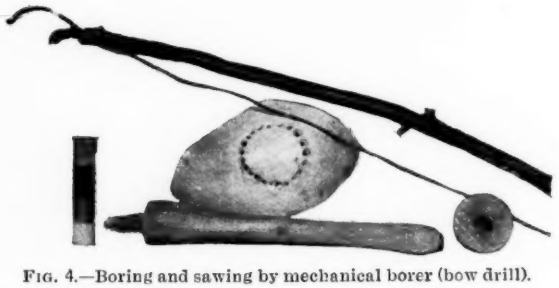

FIG. 4.—Boring and sawing by mechanical borer (bow drill).

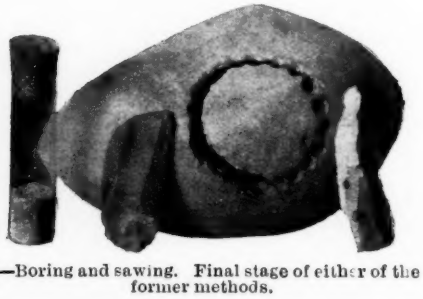

FIG. 5.—Boring and sawing. Final stage of either of the two former methods.

FIG. 6.—Trephined Neolithic frontal bone from a long barrow, near Bisley, Gloucestershire.

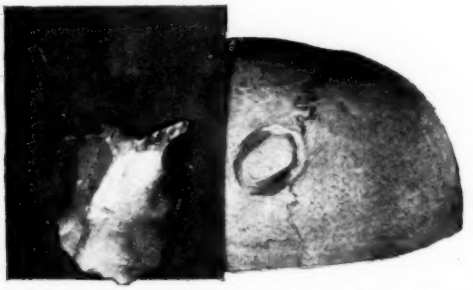

FIG. 7.—Experiment showing how Bisley skull was probably trephined.

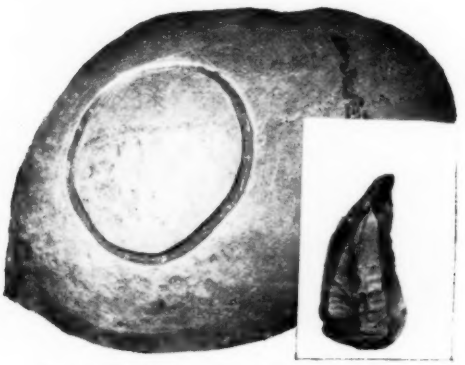

FIG. 8.—Push-plough method. First stage.

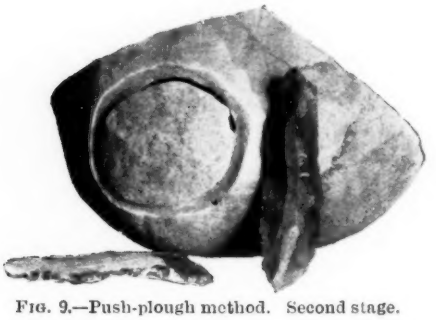

FIG. 9.—Push-plough method. Second stage.

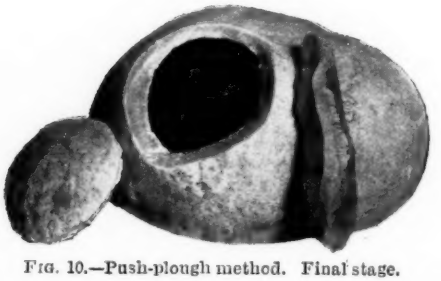

FIG. 10.—Push-plough method. Final stage.

may all result from the increased activity of the endothelium. It will be remembered that in pure forms of diffuse hyperplastic sclerosis—and in speaking of "pure" forms of diffuse hyperplastic sclerosis I mean to exclude those cases in which senile arterio-sclerosis complicates the picture—fatty degeneration is confined to the terminal arterioles of the kidney and the smaller vessels in other organs. The presence of fatty change in these vessels will be referred to later, but the point that I would make now is the absence of any change that is beyond doubt degenerative in the vessels of second size—that is, the parent vessels of those affected by fatty change.

In addition to the thickening of the intima there is sometimes hypertrophy of the media in diffuse hyperplastic sclerosis. This is the only change in the middle coat, pathological changes being characteristically absent. The medial hypertrophy cannot otherwise be regarded than as a physiological response to the increased blood pressure that is present in the majority of cases of diffuse hyperplastic sclerosis. I have previously called attention to the fact that diffuse hyperplastic sclerosis of limited extent may be found after death in bodies in which the heart is not increased above 15 oz. in weight, and in which the blood pressure during life was below 180 mm. Hg. Hypertrophy of the media is not evident in these cases. There are also cases of diffuse hyperplastic sclerosis in older cases in which fatty degeneration of the media occurs and the media appears stretched in section and apparently thinner than expected in a normal artery of the same size. I have not made exact comparison in these cases, and can only express the opinion from my observations that medial hypertrophy is a common accompaniment of marked cases of diffuse hyperplastic sclerosis, and that it is present in cases in which there was a definitely raised blood pressure during life or marked hypertrophy of the left ventricle after death, though there are slighter cases of diffuse hyperplastic sclerosis in which no medial hypertrophy occurs. This medial hypertrophy is neither the essential element nor a constant feature of diffuse hyperplastic sclerosis. It is possible that the raised blood pressure precedes the vascular lesion in some cases, and it may be, therefore, that medial hypertrophy precedes intimal thickening under these conditions; in any case the medial hypertrophy is frequently so pronounced that it is regarded by some observers as the essential element in this form of arterio-sclerosis.[12]

Gull and Sutton emphasized the thickening of the adventitia in arterio-capillary fibrosis. This is present in some cases, and I have noticed it in the renal vessels and perhaps also in the spleen. It is difficult to distinguish between an increase in the adventitia and an increase in the perivascular connective tissue which is present in considerable quantity in both these organs. It has escaped my observation in other organs of the body, and needs closer study than I have given it.

Conclusion.

The main feature of diffuse hyperplastic sclerosis is a thickening of the intima, accompanied sometimes by hypertrophy of the media. The intimal changes are the essential lesion. Activity of the endothelial cells is largely responsible for the intimal thickening. In this thickening the process of degeneration plays a secondary part; it is only certainly present in the terminal arterioles of the kidney and the smallest vessels of the other organs. The characteristic feature of the lesion is an intense tissue activity, which is the very antithesis of a process of decay. The nature of the process concerned in the production of this lesion will be considered in the next lecture.

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An Address
ON
TREPHINATION OF THE LIVING HUMAN SKULL IN PREHISTORIC TIMES.*

BY

T. WILSON PARRY, M.A., M.D.CANTAB., F.S.A.

[*With Special Plate.*]

SIXTY years ago not even the most eminent scientist in Europe was aware of the fact that, in prehistoric times, our primitive ancestors used to trephine the living skulls of their fellow tribesmen with implements made of stone. The knowledge of this was rendered possible by a discovery made by a general medical practitioner. And here I should like to say that such of you as are about to enter general practice will find, I think, this branch of our profession of a peculiarly satisfying nature, in that not only does it have for its aim the carrying out of ethical ideals by sound practical methods, but there is scope, at leisure moments, for the study of those wider interests that do not actually belong to our profession, but which are stimulated by the atmosphere created by our education, trend of thought, and environment.

Prunières, a general practitioner of Marvejols in the department of La Lozère, France, was a man who spent much of his spare time in antiquarian research. While examining a large dolmen, near Aiguières, in 1865, he discovered a skull with a curious hole in it. The hole had smooth, shelving edges which looked as if they had been polished. Prunières was puzzled as to the nature of this hole and came to the conclusion that, finding the skull in a dolmen, it had belonged to a Neolithic savage and had been converted into a drinking cup, a custom which not infrequently exists among savage tribes, and that this smooth-faced hole had been specially designed for the application of the lips. Now these dolmens were constructed during the *third* or Carnac stage of the Neolithic period, which ended in north-western Europe about two thousand years before the Christian era. The whole of the Neolithic period is computed to have lasted some twenty thousand years, the third and last division probably occupying from four to six thousand years, so that the age of these dolmens may be estimated as being not less than four and even as much as eight to ten thousand years old—the last word in these megalithic buildings being that magnificent pile known as Stonehenge, which was erected at the beginning of the Bronze Age.

Prunières was not correct in his surmise about the drinking cup. To Broca belongs the credit of explaining that the smooth, polished-looking surface of the sides of the hole in this skull was due to a healing process that had taken place in a wound of the bone during life. After this first discovery many other specimens were unearthed from the dolmens existing in those regions, so many, indeed, as to compel one to believe that, during the latter part of the Neolithic period in France, a fetish of a most extraordinary kind was prevalent among the inhabitants, and this fetish consisted in trephining the healthy human skull for some purpose of a superstitious nature, for none of the skulls showed any sign of either fracture or disease.

And now comes the point when it might very reasonably be asked, How can you definitely prove that these holes, which we now know were made during life, were the result of an operation, deliberately planned and carried out by Neolithic man? Is not this suggestion merely guesswork? Broca, having found out all he could from the nature of the specimen itself, and from the place where it was found, and the associations, turned his eyes in another direction.

Here it may be explained that all primitive tribes, on their way upward from savagery to civilization, pass through the same phases. Every nation starts with its so-called "Stone Age," when the chief material used for the making of their implements is stone. Wood, slate, shell, bone, and teeth are also used during this period. When culture has proceeded farther, metals are discovered, the first being the more malleable ones—copper and tin. By accident or experiment they find that a harder and much more serviceable metal is obtained by blending these two metals by heat, bronze being the outcome—thus the Bronze Age. When iron is discovered a stupendous advance has been made, and the early Iron Age

* Given before the Listerian Society of King's College Hospital on January 17th, 1923.

of any tribe denotes that great progress has been effected by that tribe. My point in mentioning this is to demonstrate that if only we study the life and customs of those tribes who are still going through their age of stone culture we are able, by analogy, to explain what our own ancestors did when they were passing through this early stage of evolution.

Information had been brought by travellers from certain of the South Pacific islands that the natives there actually performed this operation, at that time, on their living comrades with implements made of obsidian, shell, or shark's teeth. Since the white trader had visited those islands and introduced glass bottles—unfortunately usually in the form of whisky receptacles—the natives had manufactured implements from this glass and used these in preference to those of obsidian formerly employed. Broca had heard tales of this, and he actually made an experiment on a dead infant's skull with a piece of sharp-edged glass, and found that a hole could be made quite quickly and easily by its means. Broca had, however, only been imperfectly informed, as he came to the conclusion that all these trephine holes, in the many specimens found in France, had been made when the subjects were infants. He had not been told and he did not believe that the operation was actually performed during life on adults.

EXPERIMENTS TO DEMONSTRATE METHODS OF PRIMITIVE TREPHINATION.

Ten years ago, in order to get a correct and practical understanding of how primitive man (Neolithic and Modern) performed this operation, I began a series of some fifty experiments on both recent and dry human skulls with all the primitive implements that have been used for the purpose—namely, flint, obsidian, shark's teeth, shell, glass, and even slate. The only material likely to have been used in north-western Europe was stone, and the kind of stone best suited for the purpose is flint. Flint is, as you are well aware, of sedimentary formation, and it possesses the power when force is brought to bear upon it in a certain way of being split into flakes. These flakes can be made, according to the skill of the knapper, with sharp points and edges, and make excellent knives, saws, scrapers, and borers, such as would be required in any primitive household. Neolithic man also constructed most exquisitely shaped arrow-heads, spear-heads, and javelin-heads, for defence of the home and offence in the hunting and fighting field.

With these crude implements at his disposal Neolithic man, in different parts of the world, conducted this somewhat hazardous operation without anaesthetics, without antiseptics, and with dressings which would have shocked the susceptibilities of any member of the Listerian Society. And yet with all these drawbacks he got, like the present-day quack, amazing successes. I make out there were four principal methods by which he performed this operation—namely: (1) by scraping the bone (Figs. 1 and 2); (2) by boring a circle of holes and sawing the intervening spaces (Figs. 3, 4, and 5); (3) by furrowing the bone by the push-plough method (Figs. 6, 7, 8, 9, 10, and (?) 11); (4) by sawing out a quadrilateral button of bone (Figs. 12 and 13).

1. *Scraping.*

Whether the scraping be done by flint flakes, sharp-edged pieces of obsidian, or pieces of strong sharp shell, such as are found on the shores of the South Pacific islands, the principle and method of procedure are precisely the same. For scraping a hole in bone, metal not being considered, there can be no better natural implement than a well flaked piece of flint. Where flint cannot be obtained, as in volcanic regions, obsidian makes a good substitute. Obsidian is a natural volcanic glass and can be flaked in the same way as flint by a sharp, well directed blow. The obsidian I used came from the Lipari Islands, north of Sicily. Contrasting these two substances I would give flint the first place. A hard, sharp edge can be obtained in flint, which is more resistant to counter-pressure than is obsidian. Obsidian, like glass, can give an even sharper edge than flint, but it is much more brittle and the operator stands in some danger as regards his eyes, from the sharp spicules that fly in every direction. I may recall that while flint is a siliceous sedimentary deposit, obsidian is of igneous formation; both flint and obsidian, when freshly flaked, are excellent substances for surgical purposes. Their newly fractured surfaces, which are smooth—and in this respect obsidian would take pre-eminence—are aseptic, and this is a point of great practical value of which the primitive operator stood in blissful ignorance. It surprised me at first, in no small measure, to find how cleanly and easily a flint knife could cut through the scalp, and obsidian I found equally as good if not better. At the present day the natives of the Andaman Islands shave their heads with obsidian knives. The method I employed for scraping the trephine-hole with both flint and obsidian was the following. Having made a V- or Y-shaped incision in the scalp, as is done by the primitive Melanesians, over the selected site of the operation, I scraped as nearly as possible along a single line on the bone with a flint flake, which I held between the thumb and forefinger of my right hand. [Although Sir John Evans believed that our Neolithic ancestors used to haft some of these small flakes, I am convinced that no hafted implement was used in this case. This can be substantiated by the Melanesian method employed in these days, when the obsidian flake or piece of glass is held between the finger and thumb.] This line I gradually converted into a groove, which soon showed two more or less prominent ridges. The outer table of the skull is by no means as easy to remove in this manner as might be expected. The next step was to attack the edges of the groove with a curved movement of the scraper till a depression was produced in the bone, which gradually assumed an elliptical shape. It is now only a question of time and manipulation to convert this elliptical depression into a circular one, and thence, having penetrated the inner table of the skull, to expose the dura mater and enlarge the foramen in the bone to the size and shape required. In only one case can I remember slightly damaging the dura mater, and the reason of this was that my supply of Neolithic implements was limited and I had not to hand at the moment the particular shape I required. It must be remembered that when Neolithic man did this operation he would be bountifully supplied with probably hundreds of sharp, newly cut flakes, and immediately one became blunted, or was not to his fancy in any other way, he would naturally fling it aside and choose another. The average time taken by me to do this operation on a fresh adult skull was half an hour.

Trephining by shell was probably never attempted by Neolithic man in Europe, as our shells are not nearly strong enough to compete with such a substance as flaked flint, of which we possess a remarkable abundance. Primitive man, in the South Pacific islands, most certainly used shell for trephining, shell knives for ordinary use, and shell lancets for opening abscesses. I experimented, however, with an ordinary beach-worn oyster shell, and found I was able to trephine the skull of a 9-months-old infant in about twenty-five minutes, and, to my amazement, with a larger and stronger shell I made a large hole in the somewhat soft skull of a Maori in thirteen and a half minutes. What could not, therefore, be done with some of the powerful shells that are so prevalent among the islands of the South Pacific Ocean?

2. *Boring with Sawing.*

Whether hand flint borers (Fig. 3), hafted flint borers, flint-tipped mechanical borers (Fig. 4), or hafted shark's teeth be used, the method employed is precisely the same. A series of holes, packed as closely together as possible, were bored in the form of a circle. These would number perhaps from fifteen to twenty-two, according to the size of the bone required to be removed. Having done this the bridges of bone between the holes would be cut through either by the side-to-side action of a strong flint flake or by means of a flint saw (Fig. 5). The enclosed rondel of bone was then liberated. This is a very arduous operation, especially if the holes are made by a hand borer (Fig. 3). A hand borer is a flint implement tapering to a point, held either directly in the hand or hafted into a wooden handle and used as if it were a clumsy brad-awl. A quicker and much more effective method of drilling holes was most probably used. The bow drill (Fig. 4) is one of the oldest mechanical contrivances in existence. Canadian Indians, in pre-Columbian days, used one of these, without having any hard material affixed to its end, to make fire by friction against another piece of wood, touchwood or dried leaves being placed in near proximity to catch the spark. With a sharp point of some hard material this contrivance was used for drilling holes. I show you a lantern slide of an Incan skull on which this operation has been performed. I think the regularity of the holes and their proximity to each other will convince you, as it has convinced me, that they have been bored by mechanical means. This operation takes a considerably longer time to perform than one done by scraping, but, of course, a much larger hole can be made. It took me twenty-five minutes to do the first stage alone (drilling the circle of holes) on the cadaver of a male 68 years

of age, and it took me sixty-five minutes to remove a rondel from the skull of a female 40 years of age.

Another method of boring holes, and one which was formerly used in Melanesia, was by shark's teeth. As regards shark's teeth as surgical instruments, I am satisfied that, metal being again excluded, there is no more excellent natural implement for boring holes in bone than a hafted shark's tooth. Its keenly serrated edges and its strong, sharp point make it an instrument invaluable to the primitive surgeon. It moreover possesses a natural flange, which converts it into a trephine of undeniable utility, for the flange is so placed as to prevent the point penetrating too deeply into the thickness of the bone to the wounding of the dura mater. A ring of holes, packed closely together as before, followed by the breaking down of the bridges between them by a scraping and saw-like action of the implement, makes a hole, after removal of the rondel, with which any surgeon may be happily satisfied. Although it took me only twelve minutes to do this operation on the skull of an infant aged 14 months, it took me one and a quarter hours to do the first stage only of the same operation on an adult dry specimen and one and three-quarter hours to do a complete operation on another dry specimen.

3. *The Push-plough Method.*

Coming under neither of the two previous heads (scraping or boring) is, I am convinced, another primitive surgical procedure to which I find no reference in the literature of the subject. Lucas-Championnière does not successfully tackle the problem of how those skulls, found in the French dolmens, exhibiting extremely large trephinations, were operated upon to produce such extraordinary effects. As the edge of the trephine ring shows a partial healing process they cannot be classed as examples of *post-mortem* mutilations of the skull for the purpose of making amulets. In the Museum of the Royal College of Surgeons casts of some of these skulls can be seen, and it fills one with amazement to consider the daring of the primitive surgeon, a feeling which, unfortunately, is mingled with a lack of admiration for his quality of judgement. Lucas-Championnière was inclined to believe that those trephinations that were not done by scraping were done by boring and sawing in the way we have already described. Now no one could possibly imagine that these large trephinations of which I speak were done merely by scraping the bone with a flint scraper; they are much too large for that, consequently it is inferred they were done by the boring method.

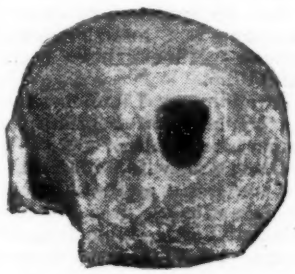

FIG. 11.—The "Edinburgh" prehistoric (?) trephined skull. (Wellcome Hist. Med. Museum.)

It is inconceivable to me that a large boring operation could be performed without there being left behind indisputable evidence of this method having been employed, for when the bridges of bone separating the perforations are cut through a large very ragged ring, comprised of half-holes and half-bridges, remains to tell the tale of how the rondel had been removed. No amount of new bone formation could completely obliterate this. It is possible, I grant, that by extending an already abnormally long operation the surgeon, by a special scraping manipulation, could have done this. But was this likely? In a carefully planned burglary the expert thief thoughtfully leaves behind no trace of his criminal work whereby he may be identified. The Neolithic surgeon was not placed in this position. An operation of this kind would take some hours' hard work, and even if the patient had not become weary of it the surgeon himself would begin to show signs of fatigue and would not be anxious to prolong the proceeding merely for aesthetic reasons.

In the Geological Section of the Museum of Lisbon is a cranium that was taken from the grotto of Casa da Moura at Peniché in Portugal. This grotto contained the remains of no less than 140 individuals of the Neolithic period. This cranium exhibits an unfinished trephination on the left parietal bone, the piece to have been removed being elliptical in shape, 60 mm. long by 20 mm. broad. There are no signs of reparation, which means either that the patient died before the operation was completed or the surgeon gave up either for his own or the patient's sake. I think we may perhaps best describe it as the first stage of another kind of operation. To me it furnishes a valuable clue as to the nature of the finished operation, which would when completed have represented, in my opinion, the method employed by the "French" Neolithic surgeon to bring about those large trephinations of which I have spoken. I think this operation was done by pushing forward a beaked flint implement, used in such a way as to first make a line, then a shallow groove, then a furrow, which, when deepened by continually traversing the same direction, eventually would plough through the diploë and reach the inner table of the skull. When nothing but the vitreous layer remained the rondel would be levered out by a stone or bone elevator (Figs. 8, 9, and 10). Professor Sir Arthur Keith, Conservator of the Museum of the Royal College of Surgeons, agrees with me that this was probably the method employed in removing the great pieces of skull bone which specimens prove were actually accomplished—unhappily, alas! not to the benefit of the patient so treated.

4. *Sawing.*

There is yet another method that was made use of in prehistoric times. We have no proof, however, that this method was employed in Europe, in Africa, or in any of the islands of the Australian Archipelago. It was a very dangerous operation, and there is not on record a single case of success. It consisted in sawing out, with a stone implement, a quadrilateral button of bone, by four straight cuts, leaving on the skull a figure closely resembling a parallelogram with extended sides, such as we were wont to draw as children when playing the game of naughts and crosses (Figs. 12 and 13). If the skull were a level plane there might have been a shadow of a chance of success; but, the skull having a contour of its own, it stands to reason that in order to penetrate the inner table of the skull equally in every direction, which was necessary for the removal of a piece of bone, that part of the skull which was most convex would have to be cut deeper than the level of the extended incisions; thus not only would the dura mater, under the convex part, become damaged, but even the brain substance itself be lacerated to the extent of several millimetres in depth. This operation was performed by the Incan and pre-Incan peoples that inhabited prehistoric Peru. The first specimen displaying this operation, brought to the notice of European surgeons in the year 1867, was discovered by Mr. E. G. Squier (Fig. 12). Both Broca and Nélaton examined this skull, the former giving it as his opinion that the patient lived no longer than seven days after the operation, while the latter put it down as ten. This was judged, of course, by the amount of reparation exhibited by the edges of the aperture. I show you a lantern slide of this skull, as well as of two others which were also excavated in Peru.

FIG. 12.—Skull of prehistoric Peruvian, discovered by Mr. E. G. Squier in 1867.

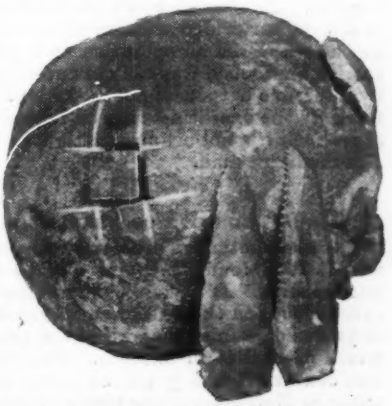

FIG. 13.—Experiment on dry skull, with flint saw, to show how the Incan skull had been trephined.

SHOCK AND ANAESTHETICS.

There is very little shock, I am convinced, with this operation. There is no feeling in bone; if an exposed piece of healthy bone be tapped with a probe the patient does not flinch. Moreover, the scalp has not the keen sensitiveness of other sentient surfaces in the body. I was very fortunate,

during the war, in coming across a Polish doctor from Warsaw who had been doing research work on this very subject in Germany, but had been obliged to take refuge in our country. He would not permit me to make known his name, so I very much regret I cannot give him that personal acknowledgement he deserves in this branch of research. He was working with Dr. Klaatsch of Breslau, who was professor of anthropology in Dresden. He performed operations (primitive and otherwise) on cats and dogs in connexion with trephination (occipital and frontal) to test the amount of shock occurring in connexion with them. Cats and pigs are particularly nervous subjects and show glycosuria on the least provocation of shock. Dogs and rabbits show shock or pain by intestinal contractions; thus shock can be scientifically estimated. The results of the experiments were that no glycosuria occurred from performing the primitive operation of trephination, with flint, on cats, and shock was found to be very slight with the same primitive operation performed on large dogs.

Probably the two earliest discovered anodynes were mandragora and opium, as both these drugs are mentioned in the Papyrus Ebers, which was found near Thebes, and dates from the eighteenth dynasty, about 1500 B.C., some five hundred years after the age of stone culture had closed for France and Great Britain, and indeed for the greater part of Europe. The first mention of opium in Europe is by Theophrastus, which did not occur till 300 B.C. In the first century Dioscorides describes the method of obtaining the juice from the capsules, and Pliny describes its medicinal uses. Dioscorides describes how "Cyprus wine" was made from the mandragora root, and that a dose of it was given to a patient before operating to induce sleep. Among the Swiss lake dwellings a whole cake of the seeds of the garden or opium poppy was found at Robenhausen, but as these seeds are destitute of narcotic properties, which are almost entirely confined to the capsules, the seeds were no doubt pressed for the extraction of oil, or, it has been suggested, they may have been eaten scattered on bread.

About twenty years ago an interesting custom was discovered amongst the Peruvian Indians. They fill a wound with powdered coca leaves, which contain some 9 per cent. of cocaine, and they find after waiting a little while they can do what they like with the part affected without inflicting pain. It is not unlikely that the Incan and pre-Incan races availed themselves of this local anaesthetic when they performed their trephinations, though we have no evidence that this method was used in Europe. Mr. Hilton-Simpson has lately been studying primitive surgery among the Arabs in Algeria. Trephination, which is not at all uncommon there, is always performed without an anaesthetic. He told me that he had witnessed an operation on a young girl, who, becoming restive and noisy, was only silenced into operative subjection by a terrible outpouring of oaths and foul language administered by the operating surgeon himself. I have no doubt that some such hypnotic anaesthetic was employed by the Stone Age medicine man.

Distribution of Prehistoric Trephination.

The distribution of prehistoric trephination is *almost* world-wide. It is found in parts of both the eastern and western hemispheres. It must be understood, however, it was never synchronous in these different regions of the earth, thousands of years sometimes separating the practice in one part of the world from that in another. To give just one example. In this country it was practised some four thousand years ago, while in Melanesia—that group of islands situated in Oceania to the east of New Guinea and Australia—primitive trephination is performed to-day with all the simplicity and crudeness it was practised in prehistoric times thousands of years ago. There is no doubt that an ethical need for it arose at a certain time among diverse primitive civilizations when in the state of stone culture, demonology, with special reference to epilepsy, being the primary cause of its being first suggested and then practised. Although migration may have had influence upon this strange custom being disseminated, I do not believe it was answerable for its unified spread, the reason being that it was used in one part of the world for an entirely different reason from what it was in other parts. In one part of Melanesia it is actually employed to promote longevity, handsome youths and beautiful girls being specially singled out for its practice.

In the eastern hemisphere Europe has the distinction of being the leading continent, and in Europe France is the first country, by a long way, to be able to exhibit the largest number of specimens of this unique fetish. Great Britain, Scandinavia (particularly Denmark and Sweden), Germany, Bohemia, Poland and Russia (especially the Caucasian region), Portugal, and Montenegro, have all some skulls to prove its practice in those countries. I know of none that have been yet found in Spain or Italy. Passing over the Mediterranean Sea we find it has been practised in Algeria amongst the Kabyles from very early times, and it is to-day performed by the Arab Shamans, with primitive metal instruments, in the most primitive way, without anaesthetics, without antiseptics, and with the crudest possible dressings. Specimens have been found in the Canary Isles. In Teneriffe von Luschan collected 210 Guanche skulls, ten of which had been trephined. He found others in which the outer table only had been scraped away. Professor Elliot Smith has examined 15,000 skulls from ancient Egypt and Nubia, but tells me he has never found a trephined specimen. I should like to show you a lantern slide of one of them. I have not seen this skull, but the specimen seems to me to so clearly illustrate a depressed fracture that has been treated in this way that I bring before your notice two pictures of it—one a front view and the other a profile one. The Guanches are supposed to have migrated from Egypt, so one would have expected to have found specimens there. It is possible, of course, that the custom was acquired in the Canary Isles after they had been separated from the mainland of north-west Africa.

In Asia, Daghestan can exhibit primitive specimens, and they have also been found in Japan; but the vast area of Asia has hitherto been unexplored from this view-point, and one day, no doubt, other specimens will be unearthed, when new classifications will have to be made.

In the western hemisphere we find no specimen whatever to prove that this operation was attempted on the living skull in North America, but *post-mortem* specimens have been discovered in Michigan, Illinois, and Ohio.

In Mexico, among the ancient Tarahumares, Lumholz discovered two skulls that had been trephined in a primitive manner, one during life and the other after death.

Very many specimens have been excavated in South America, notably in Peru, where the Incan and pre-Incan races practised this art for surgical and most probably for medical and ethical purposes, though not a single human amulet has yet been discovered there. In Bolivia specimens have also been found.

The imaginary line separating the eastern from the western hemisphere cuts through the group of islands in the South Pacific known as Melanesia. In this group it was practised. There are specimens in the Museum of the Royal College of Surgeons from both New Britain (Neu Pommern)—where the operation is performed for fractures only—and New Ireland (Neu Mecklenburg)—where the operation is performed for epilepsy and insanity. In 1874 Ella described an operation that he had himself witnessed in Uvea in the Loyalty group, and as early as 1831 William Ellis described an operation that he had seen performed in the island Bora-Bora in the Society group, over 2,500 miles to the east of the Loyalties. It is still practised in many of these islands, sometimes for fractures of the skull produced by sling-stones or by clubs, and sometimes for epilepsy or other head disorders supposed to be caused by demoniacal possession.

I will finish by showing you the lantern slide of a skull mounted in an elaborate glass-sided reliquary, which is to be seen in the cathedral at Avranches in Brittany. The skull is supposed to have belonged to Saint Aubert, who became Bishop of Avranches in the year 708, founded the church on St. Michael's Mount, and died in 725. This skull has a circular hole in it which was supposed to have been made by the forefinger of the Archangel Michael. If you will examine the hole carefully you will find it is an exact replica in size, shape, and shelving edges of one of those holes I have been showing you to-night—a facsimile, indeed, of a prehistoric trephination; and I suggest to you that if it is not what it purports to be it is a Neolithic trephined skull that must have been found in one of the many dolmens that exist in Brittany, the Carnac region of which has played such an important part in European Neolithic history. The individual in question, therefore, who owned this skull must have lived some three thousand years before Saint Aubert, the learned Bishop of Avranches, was born!

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THE VALUE OF LABORATORY TESTS IN DISEASES OF THE LIVER AND PANCREAS.*

BY

W. LANGDON BROWN, M.A., M.D.CANTAB., F.R.C.P.,

PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL; CONSULTING PHYSICIAN TO THE METROPOLITAN HOSPITAL; EXAMINER IN PHARMACOLOGY AND THERAPEUTICS, UNIVERSITY OF CAMBRIDGE.

IT is clear that in the time at my disposal nothing more than a very general review of this large subject can be attempted. The liver and pancreas are both developed as outgrowths of the alimentary tract, and their ducts are innervated in the same general way as the canal from which they develop. Their close co-operation is further shown in the way they pour their secretions into the alimentary tract at the same point, in their complementary rôles in the utilization of fat and in carbohydrate metabolism, as well as by the circulatory conditions which ensure that any internal secretion from the pancreas shall pass straight to the liver. Situated on the path by which all the blood from the digestive organs enters the systemic circulation, it is not surprising to find that the liver helps to prepare all three foodstuffs for utilization by the tissues. The bile it forms is at once an excretion and a secretion. But further, the liver is an important agent in detoxication and in maintaining the constant composition of the blood.

The earlier and simpler attempts to estimate the functional efficiency of the liver failed because its great reserve capacity was not realized. For, like the heart, lungs, and the kidneys, the liver does not normally exert its full activity, and so does not reveal its failure of function to ordinary tests until this has fallen to so low a limit that grave hepatic damage is no longer in doubt, and the time for successful treatment is past. Moreover, not only must the power of the liver to undergo compensatory hyperplasia be remembered, but, its various functions not being equally inhibited by disease, it is necessary to apply tests covering different fields of hepatic activity.

In the first place I shall consider tests related to the action of the liver in preparing the three foodstuffs for the tissues.

I. TESTS FOR HEPATIC METABOLISM.

(1) *Protein.*

It has been clearly recognized for some years that the protein molecule is broken down into its ultimate amino-acids before absorption, and that these end-products are less toxic than the intermediate proteoses and polypeptides from which they arise. Further, as there is a chemical specificity of tissues, by no means all of such end-products are capable of being utilized for tissue repair at the time of their entering the blood stream. Those which cannot be used at once by the tissues are turned into urea and other excretory products. Indeed, the method of maintaining the nutrition of the body is as far as possible the same on an ample protein diet as in starvation. In both, amino-acids are used to make deficiencies good, though in starvation they are obtained by pooling the autolytic products obtained, as it were, by levying a tax on all the cells of the body. From this pool individual organs are allowed to draw, according to their functional importance to the body. But even in the well fed body the excess of protein food above what is required for tissue repair is not stored but excreted. Naturally, therefore, much more nitrogen is excreted by the well fed than by the starving body, any storage being provided from non-nitrogenous sources.

It would appear that each amino-acid has its own method of breakdown, and very probably its own ferment for achieving that purpose. This has been brought out clearly by Garrod in his study of the inborn errors of metabolism. He says:

> "If any one step in the process fail, the intermediate product in being at the point of arrest will escape further change, just as when the film of the biograph is brought to a standstill the moving figures are left, foot in air."

Now it happens that most of such inborn errors as alkaptonuria, pentosuria, and cystinuria are inconvenient rather than serious. They are also rare, and although their study has established points of great theoretical importance as to protein breakdown, they do not throw light on the estimation of hepatic efficiency. The ferments involved are evidently very resistant normally, since these substances do not appear in extensive degenerations of the liver, although porphyrinuria, which is sometimes an inborn error, may also occur in hepatic disease. The detection of leucin and tyrosin in the urine was thought at one time to be evidence of failure of the liver to turn them into urea, but they are now regarded merely as signs of hepatic disintegration. Though most prominent in acute yellow atrophy, they may be found in other diseases. Thus I saw them in a case of cirrhosis, where a severe haematemesis had been followed by coma for forty-eight hours, yet ultimately recovery took place. But it must be admitted that nothing has been found clinically to correspond to the experimental results obtained by Eck's fistula, even, for instance, after the Talma-Morrison operation, and certainly nothing that would form the basis for a test of hepatic inefficiency in respect of protein metabolism.

The nitrogen partition test aims at doing this by determining any loss of the dis-aminating and urea-forming functions of the liver. *A priori* one would expect to find that in failure of hepatic efficiency the urea excretion would fall, while the excretion of the precursors of urea such as ammonia and amino-acids would rise. But in practice we are met with the following difficulties: (1) Quite a small proportion of the total liver substance is adequate to make the normal amount of urea. (2) As so much of the urea comes direct from the food, the total amount excreted varies with the diet. On a liberal protein diet the urea forms about 86 per cent. of the total nitrogen, while in the healthy fasting individual it forms a much smaller proportion. This variation seriously affects nitrogen partition, without implying any disease. (3) An absolute increase in ammonia formation may be, and usually is, simply a protective step against acidosis, and is not evidence of a failure of urea formation. (4) Variations in the kidney threshold may materially affect nitrogenous excretion. This last difficulty can be surmounted by examination of the blood rather than of the urine, but the other three seem to me largely to vitiate the nitrogen partition test.

Again, in normal pregnancy de Wesselow and Wyatt have shown that a low urea excretion is the rule, because nitrogen is being diverted to the use of the foetus, so much so that a rise of blood urea above 40 mg. per cent., which would be within normal limits otherwise, implies a failure of renal function in pregnancy. This adds to the difficulty in applying nitrogen partition tests to the hepatic toxaemias of this condition.

(2) *Carbohydrates.*

All sugars are absorbed as monosaccharides. Although they can be rapidly stored in the liver and muscles, the absorption from the alimentary tract of any such sugar, with the important exception of levulose, leads to a rise of blood sugar from the fasting level of 0.1 per cent. to something like 0.16 per cent., falling again in about one and a half hours. This would imply that levulose, although its limit of tolerance tends to be rather lower than that of dextrose, can within that limit be stored as rapidly as it can enter the blood stream. Years ago H. Strauss regarded a diminished tolerance for levulose as evidence of impaired hepatic function, but this did not afford a satisfactory basis for a test. It is not sensitive enough, and the kidney threshold for the excretion of sugars is not a constant. Maclean and de Wesselow,[1] having determined that levulose when given by the mouth in doses of from 30 to 50 grams does not raise the blood sugar in healthy subjects with an intact liver, went on to show that when the liver is defective it is not able to store levulose fast enough to prevent it from entering the blood stream, and thus increasing the blood sugar proportionately to the hepatic defect. This is the basis of the modern levulose test, which seems to me one of the best we have for hepatic efficiency. According to Spence, it shows that so-called catarrhal jaundice cannot be due to mere ascending catarrh of the main bile ducts, but must involve some hepatitis, since administration of levulose raises blood sugar in this disease even before the onset of jaundice. It has enabled several observers to show a similar change in salvarsan poisoning, while Mackenzie Wallis has found that in every case where a course of such an arsenical preparation has been given, some degree of hepatic inefficiency exists for at least three months. Clearly a second course should not be given within this interval; while, if levulose cause a rise of blood sugar of 0.05 per cent. above the fasting level, careful treatment is required, however slight the other clinical manifestations may be. In pure obstructive jaundice this rise of blood

* A paper read to open a discussion at the Medical Society of London, March 12th, 1923.

sugar does not occur, or is very slight. As further evidence that catarrhal jaundice may involve a toxic hepatitis I should like to refer to a group of cases I saw last year where, in addition to a large and tender liver, with jaundice, there was cyanosis, air hunger, and almost complete suppression of urine, followed by intense albuminuria, sometimes with haematuria and casts. Yet the patients made a good recovery and soon became free from albumin. Sometimes they showed an increased diastase output, which might be held to prove pancreatic involvement as well.

It is perhaps convenient to discuss the diastase test here, even though this anticipates the subject of pancreatic tests. It was originally designed by Wohlgemuth as a test for renal efficiency. He took the amount of urine which could digest 2 c.cm. of a 0.1 per cent. solution of starch paste in half an hour as the measure of its diastatic activity, which normally may range between 10 and 33.3 units. He claimed that if renal efficiency were impaired the output of diastase would fall. Working with Mackenzie Wallis in cases of war nephritis I was of opinion that this method of using the test was a guide to the amount of renal damage, for cases showing 5 units or less proved more obstinate than those with a more normal output. But subsequent work has shown that the diastase in the urine does not necessarily run parallel with the diastase in the blood, which is perhaps what we might expect from what we know of the behaviour of the kidney threshold towards substances useful to the body. The test has proved of more value in the recognition of pancreatic disease because here the alteration of the amount in the blood is so gross that the renal threshold is, as it were, flooded. In acute pancreatitis one might find 300 to 500 units—in one case of mine 1,000 were present—while in less acute cases 50 to 100 units may be found. In very chronic conditions there may be no excess, but even a deficiency. In ordinary clinical diabetes a low value is the rule. It was at first assumed that this diastase was merely pancreatic amylopsin reabsorbed into the blood stream, and was evidence of some obstruction to the pancreatic ducts, though in that case it would not be easy to explain its presence in normal urine. But Cammidge,[2] with Forsyth and Howard, has adduced cogent reasons for believing this diastase is hepatic in origin. The diastase value rises as more and more of an animal's pancreas is excised, right up to total extirpation. As it is clearly impossible for a non-existent gland to produce an enzyme, diastase cannot come from the pancreas. On the other hand, hydrazine phosphate, which has a toxic effect on the liver but not on the pancreas, reduces and may completely abolish the diastase output. These authors conclude that diastase is the agent which converts glycogen into sugar, and that its action is controlled by the internal secretion of the pancreas. If such control fails there is for a time a greatly increased production of diastase by the liver, though this may not by itself produce glycosuria. So far, however, though gross increase in diastase output certainly suggests pancreatic insufficiency, a defect of diastase in the blood has not helped much as evidence of hepatic insufficiency. Harrison and Lawrence[3] found in twenty cases of hepatic disease that the blood diastase was low in three severe cases. In two this rose again as the clinical condition improved. Certainly defective output in the urine could not provide such evidence because of the behaviour of the threshold of the kidney.

One thing appears clear about the glycogenic function of the liver: in the presence of an ample supply of glycogen the metabolism of the liver proceeds more smoothly. It was first stated that it was the antitoxic power of the liver which chiefly was affected by the glycogen store. But it seems more far-reaching than this, though it is certainly true that a liver is less liable to post-anaesthetic poisoning if it is well supplied with carbohydrate, while starvation, which would deplete the glycogen store, increases the liability to this catastrophe. And Colonel Harrison, at Maclean's suggestion, has found giving sugar, usually dextrose, of material benefit in preventing toxic jaundice after salvarsan. In a group of patients receiving sugar before injection there were only two or three cases, while in another group not receiving sugar there were nearly fifty cases of toxic jaundice.

(3) *Fats.*

Leathes has shown that the fat normally present in the liver is in the more active unsaturated form, but that the fatty deposit which occurs there in poisoning by phosphorus or tetrachlorethane or after anaesthetics is in the more inert, saturated form. He makes out a good case for regarding as a function of the liver the conversion of saturated fat into the more active unsaturated form for utilization by the tissues. When the liver is thrown out of gear by various toxins the tissues, starving for prepared fats, send unprepared fats to the liver, but in vain, for it is unable to deal with them. The liver may be compared to a miller—the saturated fats are the wheat he grinds and the unsaturated fats are the flour that results.

Foulerton pointed out that chloroform, ether, and tetrachlorethane are solvents of fat, while phosphorus, dinitrobenzol, and trinitrotoluene are readily soluble in fats, so that the destructive effects of these poisons on the liver may be due to their being conveyed with the fats to the liver in the attempt to carry out this process. In some cases, such as phosphorus or post-anaesthetic poisoning, this carriage of fats may lead to a gross increase in the size of the liver, but we require a much more sensitive test than this. Whipple devised the lipase test to this end. Normally blood contains a very constant amount of fat-splitting ferment, but in diseases of the liver this lipase is increased, as measured by the power of the blood to split ethyl butyrate. It has been supposed, therefore, that normally the liver inhibits the formation of lipase, so that its increase in the blood is a measure of hepatic damage. Whipple has applied this to chloroform poisoning, and Mackenzie Wallis[4] to salvarsan poisoning. The damage has, however, to be rather gross before the lipase increase is enough to be relied upon.

The latter observer has further reported that in toxic jaundice due to salvarsan poisoning the cholesterol in the blood is diminished, while in this condition and in phosphorus poisoning the liver is found loaded with cholesterol esters *post mortem*. This suggests that the liver normally plays the same part both in cholesterol and fat metabolism. It may be, however, that the cholesterol is merely on its way to be excreted in the bile, but the diseased liver cannot accomplish this. Its presence in the kidney under similar conditions may be an attempt at an alternative channel of excretion. In the toxaemia of pregnancy, including a case of icterus gravis, this cholesterol disturbance was not found.

II. Tests of Antitoxic Function.

Apart from the reactions against bacterial poisons the antitoxic processes of the body are few and simple—such as oxidation, reduction, hydration, dehydration, and methylation. The protective substances are few, and the process of rendering a poison harmless by conjugating it with a protective substance is most often carried out by the liver. Thus the toxic indol is conjugated with sulphuric acid into a harmless ethereal sulphate, indican. Although we regard marked indicanuria as evidence of intestinal toxaemia, we must remember that we are testing for that part of the indol which has been rendered innocuous. A more accurate method is to estimate the ratio between ethereal and total sulphates; the larger fraction the former constitutes of the latter the nearer are we to the limit of the antitoxic power of the liver. But if the liver cells are diseased such conjugation cannot occur, so that toxic substances like indol, skatol, and phenol can pass direct into the blood, even though the urinary output of ethereal sulphate is low. There does not appear to be any simple test for recognizing this.

Glycuronic acid is another important protective substance, and the formation of harmless glycuronates after administration of camphor, morphine, and the like is a function of the liver. It is claimed that 7½ grains of camphor given by the mouth should be completely conjugated with glycuronic acid and recognized by its reducing action in the urine, but if the liver is diseased no such glycuronic acid is formed. A simpler test is that introduced by Roch.[5] He gives half a grain of sodium salicylate an hour before food. This should be turned into a glycuronate which would not yield a purple colour with 1 per cent. ferric chloride solution. If the urine excreted for the four hours after a meal does give this colour hepatic insufficiency is present.

The *haemoclasic crisis* may also be regarded as due to a failure of the antitoxic power of the liver. As C. M. Wilson expresses it, under this rather forbidding name is concealed a test disarming in its simplicity. Widal[6] maintained that when the liver was diseased the normal post-prandial leucocytosis was replaced by a leucopenia, which was accompanied by a fall of blood pressure. This was believed to be due to the hepatic failure permitting the entrance of incompletely digested proteins into the systemic circulation. It recalls the anaphylactic reaction to material unsuitable for assimilation. Before breakfast a white count is taken, then 7 oz. of

milk are drunk, and another count taken twenty minutes later. Wilson concludes that, with the possible exception of the levulose tolerance test, this is the only test which gives an early warning of hepatic insufficiency.

III. Tests of Biliary Function.

Turning to the external secretion of the liver, the bile, we may first consider tests for alterations in its discharge into the bowel. The gall bladder not only regulates the occurrence of this discharge at the time it is required, but by adding cholesterol and mucin to the bile while absorbing water alters its composition, making it more concentrated and viscid. Therefore with complete obstruction to the cystic duct, the bile entering the intestine is unusually dilute. H. E. Griffiths[7] confirmed the general clinical impression that gall stones produce reflex hyperchlorhydria by finding this in 90 per cent. of the test meals on his cases. If this was not accompanied by regurgitation into the stomach there was usually *x*-ray evidence of marked pylorospasm. He attributes this regurgitation to the unregulated flow of bile into the duodenum which follows such diseases of the gall bladder as render it incapable of acting as a reservoir. A rise in the alkalinity of the duodenum at inappropriate times would relax the pyloric sphincter. This would occur when the cystic duct is occluded, or where the muscle of the gall bladder has been replaced by fibrous tissue as the result of prolonged disease, but would not follow complete obstruction of the bile duct, which would diminish the alkalinity of the duodenal contents. If it agrees with the other findings we may consider hyperchlorhydria to be the rule with disease of the gall bladder and bile ducts, while if there is regurgitation as well there is probably chronic disease of the gall bladder itself. Additional interest has been aroused in this part of the subject by the claim that if 1 to 4 drachms of magnesium sulphate in concentrated solution be introduced into the stomach a sharp flow of bile into the duodenum is excreted by reflex contraction of the gall bladder. By the use of an Einhorn tube this can be removed from the duodenum for examination. This claim has been disputed, and it is clear that if there is complete obstruction of the bile ducts the method is not applicable. But that it is occasionally of service is shown by a case in which I diagnosed inflammation of the gall bladder as the cause of dyspepsia. By this method purulent fluid was obtained, and at operation empyema of the gall bladder was found. Lyon[8] has extended this method by collecting three samples of bile by the duodenal tube. The first sample should be of transparent, yellow-golden colour from the common duct, the second darker and more viscid from the gall bladder, and the third much thinner and lighter in colour from the hepatic and intrahepatic ducts. By examination of these he claims that infection and inflammation of the various parts of the biliary system may be located.

If bile fails to enter the bowel the ill effects are principally due to the absence of bile salts, which may be regarded as the main secretion, the other ingredients being largely excretory. As they help in the emulsification and absorption of fats which have been previously split into fatty acid and glycerin by the pancreatic juice, the steatorrhoea which follows biliary obstruction is due to the increase of soaps and fatty acids in the stools, while in failure of the pancreatic secretion it will be the unsplit or neutral fat that will be in excess. Interference with absorption of proteins will lead to increased intestinal putrefaction with a consequent increase in the indican of the urine. The absence of bile pigment from the stools causes the familiar clay colour, but as the excess of fat may mask the presence of a small amount of bile we must not conclude from this colour alone that no bile is entering the intestine. Extraction of such faeces with acid alcohol or amyl alcohol may still show the presence of urobilin by the band in the blue of the spectrum or by green fluorescence on the addition of zinc chloride and ammonia. This would indicate incomplete obstruction, such as is usual with gall stones, while the entire absence of urobilin is suggestive of the more complete obstruction produced by new growth of the head of the pancreas. The presence of obvious bile pigment in the stools in a case of jaundice is, of course, against its being of obstructive origin.

I am obliged to Sir Humphry Rolleston for calling my attention to the phenol-tetrachlor-phthalein test. When phenolphthalein is given subcutaneously it is only excreted by the liver, but when this organ is damaged by phosphorus or chloroform, or when cholangitis is present, the output of the dye into the bile is diminished, as determined by faecal analysis or by Einhorn's tube, and it appears in the urine. This test is naturally inapplicable when the common duct is completely obstructed.

Van den Bergh's Test.—Of late, however, interest has chiefly centred round the distinction between obstructive and toxic jaundice, based on van den Bergh's test. It has long been recognized that bile pigments originate from haemoglobin, but recently it has been urged by Brule[9] that the liver merely separates bilirubin from the blood as the kidneys do urea, and Whipple regards the star-shaped Kupffer cells of endothelial origin along the capillary walls as responsible for this work. Van den Bergh[10] has described two varieties of bilirubin, which can be distinguished in the serum by Ehrlich's diazo-reaction. In obstructive jaundice the test comes off directly, while in haemolytic jaundice the bilirubin, being linked with some constituent of the serum, does not give the reaction until the combination is broken up—for example, by alcohol. McNee has suggested that it is normally the work of the Kupffer cells to do this, and that when they are damaged the bilirubin escapes this modification and gives the indirect reaction only. Dr. Christopher Andrewes has been trying this test at St. Bartholomew's Hospital, and I am much indebted to him for placing his as yet unpublished results, based on 108 cases, at my disposal. He says:

> "Practically all the cases are compatible with the theory that the direct reaction is due to obstruction (either of larger or finer ducts) and that the indirect reaction is due either to disordered function of liver cells or to increased haemolysis. So that the cases might be classified into (1) gross obstruction, including cholelithiasis, new growths, etc.; (2) haemolytic jaundice, such as pernicious anaemia and acholuric jaundice; (3) conditions such as catarrhal jaundice and heart failure, in which the factors of liver cell damage and obstruction to the finer ducts can probably occur together or separately. Other observers have found that cases of this third group may give an indirect reaction at first, and go through a biphasic to a direct reaction. It is this mixture in many diseases which seems to me to limit seriously the clinical value of this test. My cases of catarrhal jaundice show 8 direct reactions. Others have found more numerous cases giving indirect reactions. Schiff and Eliasberg[11] in an 'epidemic' in children found all indirect reactions at one stage and all direct reactions at another."

The general conclusions to which Dr. Andrewes comes are these:

1. As a test of liver function it is very gross, being, however, a little more sensitive than clinical evidence of jaundice. Thus several cases of cirrhosis gave normal results.
2. As an aid to diagnosis of the cause of jaundice, it is of very little value. A well marked indirect reaction indicates catarrhal jaundice rather than stone. A direct reaction may mean either.
3. In anaemia an indirect reaction above normal indicates a haemolytic cause, probably pernicious rather than secondary. The test is probably rather more reliable than examination for urobilinuria.
4. The estimation of bilirubin in blood-stained fluids (pleural, peritoneal, cerebro-spinal) can decide whether the bleeding is old or produced at the time of puncture.
5. With direct reactions above 3.5 units, bile will be present in the urine; with direct reactions below this figure, and with indirect reactions, bile will be absent there.

One must conclude, I fear, from this careful study, that in its present form the test is of very limited value. It will be noted that the levulose test has given more positive evidence than van den Bergh's that catarrhal jaundice is often a hepatitis.

The Fate of the Bile Pigment.—It will be gathered from what I have already said that I lean to the view that urobilin or its chromogen is formed in the intestine by reduction of bile pigment through bacterial agency. The evidence in favour of this seems very strong, for when all bile escapes through a biliary fistula, or when complete obstruction prevents bile from entering the intestine, no urobilin is found. Again, it is absent from the faeces at birth, not appearing till bacteria have had time to establish themselves in the bowel, while if bilirubin is inoculated with intestinal bacteria urobilin is formed. Normally this urobilin colours the faeces, where it is often called "stercobilin," while a small amount is reabsorbed and appears in the urine. If there is polychromia from increased haemolysis there will be increased formation of urobilin, while if there is partial or complete obstruction to the bowel there will be increased reabsorption of urobilin. In either case urobilinuria will occur, but it has most significance as evidence of haemolysis. Against this view has been urged the presence of urobilin in the duodenal contents—that is, above the point at which bacterial activity begins. But I do not think this is sufficient to counter-

balance the mass of evidence in favour of the intestinal origin of urobilin. I am aware that urobilinuria is often regarded as evidence of "floating gall stones" or of cholangitis. I can only say I have far more often seen this diagnosis made than confirmed, when based on this test.

Bile salts in jaundice are by no means always to be found. Matthew Hay's test with flowers of sulphur is the simplest way of detecting them. I have found them present at the beginning of obstructive jaundice, and in one case even before bile pigment appeared in the urine. But later on they are generally absent, probably in part because the biliary cycle is interfered with. When bile is drained through a fistula the amount of bile salts in it soon sinks to one-tenth of the normal (Copeman). This suggests that the reabsorbed bile salts are used over again ten times. Naturally, then, in obstructive jaundice such bile salts as escape into the urine at the beginning are permanently lost, and the amount available sinks below the kidney threshold. In toxaemic jaundice bile salts are not likely to appear in the urine at any stage, both because they can get into the bowel and because their formation throws greater labour on a diseased liver than the excretion of bile pigment. The presence of bile salts, therefore, in the early stages of jaundice suggests an obstructive rather than a toxaemic cause.

IV. Tests for Pancreatic Inadequacy.

I can deal quite briefly with this part of my subject, because our views have now crystallized into something like definite form.

(1) *Signs of Defective External Secretion.*

(*a*) *Failure of Tryptic Digestion.*—Unaltered muscle nuclei may be found in the faeces after a meat meal, but this is not always easy to do, nor does it help much to stain the muscle fibres and give them with lycopodium grains as a guide. Sahli's method of administering iodine in gelatin capsules hardened by formalin, and testing for iodine in the urine and saliva, cannot be recommended. It is also claimed that trypsin can be demonstrated in normal stools by placing a small quantity of faeces on a gelatin plate, when a small area of digestion will result. Apart from detection of muscle nuclei I have not found these methods much help. A negative result is of no value.

(*b*) *Failure of Starch Digestion.*—Starch granules may be detected in the stools after unboiled starch has been given. Boiled starch can be digested by saliva. Chronic pancreatitis may cause oxaluria from intestinal fermentation of carbohydrates (Cammidge and Mayo Robson).

(*c*) *Failure of Fat Digestion.*—As already explained, the steatorrhoea of pancreatic defect takes the form of an excess of neutral, unsplit fat. This is the most valuable of the tests for deficient external secretion.

(2) *Signs of Defective Internal Secretion.*

(*a*) *Diminished Sugar Tolerance.*—This may be expressed in glycosuria, and almost certainly in hyperglycaemia, two hours after a dose of 50 to 100 grams of dextrose. The normal tolerance for dextrose is 150 to 200 grams. It must be remembered, however, that this may be a comparatively late symptom, and that it can be also produced by chronic alcoholism, hyperthyroidism, hyperpituitarism, and probably by hyperadrenalism.

(*b*) *Diastase Test.*—This has already been discussed. In my opinion it is one of the best tests for recent pancreatic damage.

(*c*) *Adrenaline Eye Test.*—Loewi showed that if adrenaline is instilled into the eye the pupil does not normally dilate. But if the pancreas is inadequate the pupil dilates in twenty to sixty minutes after one drop of the 1 in 1,000 solution is instilled, and another drop five minutes later. This is based on the antagonism between the adrenals and pancreas, of which there is other evidence. But if there is hyperthyroidism the test may also be positive, as this upsets the balance by reinforcing the adrenals. The dilatation is often an eccentric one. The test may fail if repeated within a week. Taken in conjunction with other signs, it is a simple test of some value and is easily applied. Recently, however, I saw a positive reaction in a case of acute appendicitis.

(3) *Signs of Pancreatic Disintegration.*

(*a*) If pancreatic lipase escapes into the circulation it can be found in the urine by the ethyl butyrate method (Opie).

(*b*) A pentose may sometimes be found in the urine from the breakdown of pancreatic nucleo-proteins. This is also the basis of Cammidge's test, which, however, does not seem to be very much relied upon at the present time.

To sum these tests up: If the adrenaline eye test and the diastase test are negative it is seldom worth while to undertake more elaborate investigations. If they are positive, and there is excess of unsaponified fat in the stools, it is very suggestive of pancreatic disease. If there are also muscle nuclei in the stools, it greatly strengthens the diagnosis. If all these signs are present, in addition to glycosuria, the diagnosis is almost certain.

But here, and still more with the liver tests, clinical evidence must not be neglected. When Falstaff asked his page, "Sirrah, you giant, what says the doctor to my water?" the boy replied, "He said, Sir, the water itself was a good healthy water; but for the party who owned it, he might have more diseases than he knew for." I think I know that doctor; entrenched in the laboratory, he is quite prepared, without seeing the patient, to diagnose the existence of many more diseases than the medical attendant ever "knew for" or even suspected. The reaction against this was shown in a recent discussion on renal tests, when several surgeons expressed their willingness to abide by clinical signs alone. I am neither so bold nor so sceptical, but I would urge that these laboratory tests are still themselves on trial; and that the ultimate diagnosis must rest on the clinical as well as the biochemical findings.

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THE USE OF RADIUM IN THE TREATMENT OF DISEASE.

BY

DAWSON TURNER, M.D.,

IN CHARGE OF RADIUM TREATMENT AT THE EDINBURGH ROYAL INFIRMARY.

IN a previous paper published in this JOURNAL (January 20th, p. 100) I discussed the dosage of radium; I now desire to deal briefly with the principal conditions in which radium has been found useful in the Edinburgh Royal Infirmary. They include malignant disease, exophthalmic goitre, splenomedullary leukaemia, Hodgkin's disease, keloids, and naevi.

The records show that radium has been chiefly used for malignant disease, and on the whole with encouraging, and in some cases with excellent, results. As cases of undoubted malignant disease, confirmed by operation and pathological examination, which remain perfectly well for more than seven years after the primary treatment are relatively rare, I quote the following case of recurrent sarcoma:

A woman, aged 49, recommended by Dr. Maclagan of Ayton, had developed sarcoma four years before. Several operations for the removal of the growth were unsuccessful. She was admitted to the Royal Infirmary by Mr. Miles on July 15th, 1915. A large nodular mass projected in the left suborbital region; it interfered with vision and was adherent to the maxilla. Pathological examination showed that it was a large spindle-celled sarcoma.

As Mr. Miles considered the tumour inoperable, radium treatment was recommended. By internal and external applications a dose of 5,180 milligram hours was given. In November, 1915, a further external dose of 5,180 milligram hours was given. During the applications the growth diminished markedly. In February, 1916, the tumour had greatly shrunk and was movable; it had been fixed before. The patient was better, stronger, and could see normally. The condition had so much improved that Mr. Miles removed what was left of the growth; this was followed by a prophylactic dose of 4,120 milligram hours. In November, 1916, the growth had disappeared and Mr. Miles could detect no sign of recurrence. Seven years have now elapsed since the radium treatment was begun, and Dr. Maclagan writes on January 19th, 1923: "The patient keeps well without any trace of recurrence."

Of malignant affections, rodent ulcers, epitheliomata, lympho-sarcomata, spindle-celled sarcomata, malignant disease of the cervix, sarcomata of the nasal passages, and of the non-malignant affections, exophthalmic goitre, early keloids, and certain naevi are, in my experience, very amenable to radium treatment. They might be termed first-class subjects, because they admit under favourable conditions of actual cure. Under second-class subjects—meaning thereby conditions which may be ameliorated but in which a cure can rarely be expected—might be placed carcinomata, lymphadenomata, and spleno-medullary leukaemia.

Small rodent ulcers not affecting the mucous membrane or bone are easily cured by a dose of from 500 to 800 milligram hours through a filter of silver, 1½ mm. thick. A much smaller dose would suffice to cause the ulcer to heal over, but it would probably recur. Rodent ulcers at the side of the nose where the alae nasi join the cheek are more refractory; so too are those affecting the ear and just below it. Unless completely cured by the first applications they tend to become radio-resistant and further exposures may do harm.

Small epitheliomas of the lip are quite amenable to surface applications. I have had tubes prepared with an eyehole at each end so that they can be sutured by both ends to the lip and maintained in close apposition to the growth for the necessary time. When the floor of the mouth, tongue, or fauces are attacked the condition is difficult to benefit materially by radium.

Of all new growths the most susceptible to radiations are the lympho-sarcomata. They melt away in a surprising manner but tend to recur or form metastases. Sarcomas affecting the nasal passages are favourably influenced by radium. The writer has had cases which have remained free from the disease for many years and still are free.

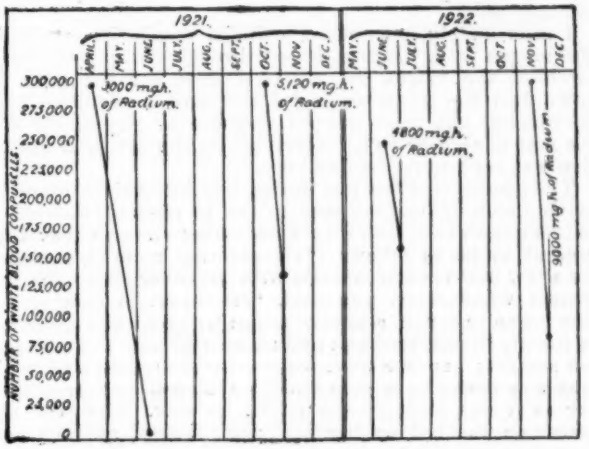
Much experience has been gained in recent years regarding the use of radium in gynaecology, but I must limit myself in this article to a few general remarks. In malignant disease of the external genitals treated by radium the prognosis as a rule is bad; in early and limited disease of the vaginal wall the prognosis seems better, and I have seen one complete cure. It is in early malignant disease of the cervix that the best results are obtained; all observers are agreed upon this. Big doses of 6,000 to 10,000 milligram hours should be given, and at the first treatment. Smaller doses repeated are a mistake. Recurrence, after a longer or shorter interval, is, however, the rule, because of the difficulty of efficiently raying the more distant portions of the disease. Few cases are sent for radium treatment which are not in an advanced condition; even in these cases, however, some improvement is always observed both locally and generally. Pain is relieved, discharges cease, ulceration heals, and the patient gains in general health, strength, and weight. An important question is, How far does the beneficent activity of radium extend? Professor Bumm found in *post-mortem* examinations of the radiated cervix that cancer cells were only destroyed to a distance of three centimetres from the radiating source. It must, however, be remembered that the sphere of beneficent activity would depend upon the length of the exposure as well as upon the quantity of radium—the longer the exposure the greater the cumulative effect upon outlying cells; moreover, those cancer cells, which appeared to Professor Bumm to be normal, may yet have been rendered incapable of proliferation. Wassermann radiated small bits of mouse cancer *in vitro*. In certain experiments the tumour retained its vitality when inoculated, but did not grow. He concluded that the rays did not kill the cancer cells, but stopped their power of proliferating.[1]

Exophthalmic goitre is a condition for which in recent years radiation has been found consistently useful. The writer has now treated with radium upwards of 200 cases, and with two exceptions all derived more or less benefit both in their general condition and special symptoms. Thus the patients regain strength, put on weight, and lose the tired feeling, and at the same time the tachycardia, tremor, and breathlessness are diminished and may disappear altogether. Not much change need be expected in the size of the thyroid or in the exophthalmos, except in early cases. It is well to warn patients of this lest they suffer disappointment; but operative measures might now be considered, to reduce the size of the gland, both because its vascularity is diminished and because the patient is better able to stand an operation. A dose of 300 to 500 milligram hours, properly screened so as to avoid injury to the skin, may be given to each lobe, to the isthmus, and over the thymus. The latter organ should not be neglected. I have had cases which were somewhat refractory so long as the applications were confined to the thyroid but which yielded rapidly when the thymus was exposed.

Under second-class subjects recurrent scirrhous nodules, even when attached to or growing from the bone, will disappear; but they recur. Carcinoma of the rectum is refractory except in limited annular strictures, where, by placing tubes inside the stricture considerable benefit may follow. In Hodgkin's disease amelioration may be expected by applications over the glands or by burying tubes inside them. In spleno-medullary leukaemia, by exposures over the spleen it will be reduced in size, the white blood corpuscles diminished, and the general health improved; but in a few months the patient will return with a recurrence; this will again yield to treatment, but will be followed by another recurrence, and each recurrence requires larger doses, and in time the patient succumbs. The following case with graph illustrates the fall in white blood corpuscles following the application of radium.

A man, aged 32, suffering for the last nine months from spleno-medullary leukaemia, was recommended by Professor Gulland for radium treatment in April, 1921. The spleen was considerably enlarged but did not cross the middle line. The white blood corpuscles numbered 310,000. He was given a dose of 3,000 milligram hours, screened by 1½ mm. of silver over the spleen. This produced a good effect, the spleen decreased, and in two months, when he was discharged, the white blood corpuscles numbered 9,600.

For four months he remained fairly well, but was then readmitted; the spleen had crossed the middle line and was also lower down. The white blood corpuscles had increased to 316 000. A dose of 5,120 milligram hours was now given under the same conditions as the previous one. In a fortnight the white blood corpuscles numbered 136,000 and he was discharged.



He had no further treatment until June, 1922, when the spleen was found to be just over the middle line and the white blood corpuscles numbered 250,000. A dose of 4,800 milligram hours was given. In a week's time he felt much better, the white blood corpuscles had fallen to 152,500, and he was discharged.

In three months (November, 1922) he was readmitted in a worse condition; the spleen was hard and reached to within one inch of the umbilicus, the liver was enlarged and painful, and the white blood corpuscles were up to 300,000. He was now given a larger dose, amounting to 9,000 milligram hours. In a week he felt better, and the white blood corpuscles had fallen to 80,000. He was able to return home, but a month later died suddenly.

In the treatment of exophthalmic goitre and of naevi in children by radiation, radium has the following advantages as compared with the *x* rays: (1) Absolutely constant emission of rays, and therefore exact dosage possible. (2) Greater penetration of its rays, so that the deeper parts are reached. (3) Saving of time, as the radiation is maintained night and day until the necessary dose has been administered. (4) No noisy, exciting apparatus, so that the treatment can be applied at the bedside without in any way alarming or disturbing the patient.

REFERENCE.
[1] F. E. Simpson: *Radium Therapy*, p. 90.

SUDDEN DEATH FROM ANAPHYLACTIC SHOCK.

BY
LIEUT.-COLONEL F. W. SUMNER, M.D.CANTAB.,
F.R.C.S.EDIN.,
INDIAN MEDICAL SERVICE.

IN my capacity of medical officer to a girls' school in Simla I was called, in October, 1922, to see a sick girl; the condition of the throat was suggestive of diphtheria, and a throat swab confirmed the suspicion. I advised the head mistress that all contacts be given a prophylactic hypodermic injection of diphtheria antitoxin and be segregated for fourteen days, and that the rest of the school be placed out of bounds. This was agreed to.

The syringe I used for inoculation was one of 10 c.cm. capacity; it was thus capable of holding the contents of several 2½ c.cm. bottles (each containing 2,000 units), and it

was possible to inject several girls out of one syringeful. The routine was as follows: A girl in room (1) would have her loin uncovered, would come into an adjoining room (2) and lie on a couch; here iodine would be applied; she would receive 1,000 units, and, holding an iodine swab to the needle-hole, would pass on to an adjoining room (3).

As I was injecting the fourth girl (the first and second girls being sisters), out of one and the same syringeful, a mistress hurriedly came to me from room (3), saying that a girl (the second of that syringeful) was not feeling well. I immediately went and found this girl (aged 8) lying on a bed; she was obviously *in extremis*, was foaming at the mouth, and breathing in a very shallow manner; her pulse was scarcely perceptible; she was almost comatose, making no sound, and incapable of speech. She was lying on her right side and was endeavouring to turn on to her face; there was some cyanosis of her face and congestion of her conjunctivae, with protrusion of her eyeballs; the region round her nose was pallid in comparison with the rest of her face; the lower part of her face had the appearance of being somewhat swollen, as also the tongue and mouth; there was no rigidity or spasm of muscles.

I immediately commenced artificial respiration, controlled the tongue by a ligature passed through its tip, periodically swabbed the mucus out of the fauces, got the head low down, had the trunk massaged, and gave a stimulant hypodermically; but there was no response or sign of life after the first minute or two. Nevertheless, the artificial respiration was kept up for half an hour.

The condition of the girl during the interval between her leaving room (2) and my seeking her in room (3)—about one to two minutes—I found, by questioning the mistress there present, to be as follows: "On entering room (3) she stood for a few seconds and laughed with the other girls; she then started whimpering, and said, 'My throat is paining me.' She began to cough, a kind of cough which a child gives who is forcing herself to cough and making herself sick; she did not stagger; her face went white round the nose and mouth (she was normally a pale child); a utensil was brought to her as it was thought she might be sick. She was then placed on the bed on her back; she foamed at the mouth, turned on her right side, had some slow movements of her left hand and arm; there was no twitching or other movements of muscles."

She had never had any previous injection of any sort.

No other of the ten cases injected had any anaphylactic symptoms, nor had the diphtheria child herself, who was given a large curative dose.

Deceased was, I understand from the school mistresses (never having myself seen her previous to this occasion), a girl of average size for her age, rather heavy in the face, and one who struck them as having enlarged tonsils and adenoids.

A careful investigation of her history brings out the following points:

1. She was always apparently a healthy child.
2. She had had only one illness, bronchopneumonia, in 1918.
3. She was subject to colds.
4. She slept with her mouth open.
5. A wheezing at her mouth could be clearly and frequently heard; a doctor said she had asthma.
6. In 1917 she was examined in St. George's Hospital, Lucknow, where the report is stated to have been: "It was necessary that the bone of her nose at the back should be scraped."
7. Her eyes would become inflamed and her nose would run whenever she took a drive behind horses, which was a frequent occurrence, but this would not happen after a motor drive; this lasted up to 1920, since when the symptoms did not occur although she had a drive behind horses every evening for months.
8. She never allowed the top button of her dress to be fastened; she gave no reason for this. (Enlarged thymus gland?)
9. She had had a fainting attack three weeks before after a heavy picnic lunch; she did not get out of breath easily; she, generally speaking, was pale and looked puffy under the eyes.
10. She had been at school for several months, and there had been no necessity to bring her to me for any treatment or examination.

Family History.

She had one sister and two brothers; the sister was at the same school, was quite healthy, had had no illnesses, and was given a prophylactic injection at the same time as her own fatal one. One brother died of heart disease after rheumatic fever; the other brother had congenital heart disease (a patent foramen ovale being diagnosed); his face was of a grey colour for six months, but this has passed off and the boy is apparently quite well.

Her father's brother, six years after a heat-stroke, died suddenly within an hour; "a necropsy was done and a large blood clot found in the head."

There is no history of bleeders in the family, and no consanguinity of the parents.

Remarks.

In this case the striking features are:

1. The likelihood of a condition of "status lymphaticus" with probable enlargement of the tonsils, adenoids, and persistent thymus.
2. The intolerance to the vicinity of horses during life (conjunctival, nasal, and bronchial catarrh and spasm resulting).
3. The intolerance to the subcutaneous injection of horse serum, causing rapid death.
4. The individuality of the intolerance; deceased's sister was one of the girls injected from the same syringeful and suffered no ill effects.
5. The diagnostic cry, "My throat pains me."
6. The diagnostic frothy viscid mucus on the lips.
7. So rapid a fatal result occurring within five minutes after injection is unique in a human being, though such rapid effects were experimentally produced in dogs.[3]
8. Severe anaphylaxis is a rare occurrence after a first injection of serum, anaphylactic shock being still rarer, and fatal anaphylactic shock practically unknown. A very rough estimate of the mortality from anaphylaxis among first injection cases at 1 per 1,000,000 and among subsequent injection cases at 1 per 10,000 would not be wide of the mark.
9. The sudden death was such an unexpected and overwhelming blow to the parents that an autopsy was out of the question.
10. A War Office pamphlet entitled *Memorandum on the Use of Curative Sera* says: "It may be remarked that sometimes anaphylactic shock occurs after a primary injection of horse serum such as is given in diphtheria, especially in persons suffering from Graves's disease, or subject to asthmatic attacks, or who are affected by emanations from horses. But this is so rare (1 in 50,000) that it may be ignored in practice."

The *post-mortem* changes as seen in Professor Dean's case[1] of a soldier dying of anaphylactic shock following antitetanic serum injections, Gurd, Fraser, and Roberts's similar case[2] and anaphylaxis studies in dogs[3] show, in brief, that, with a rapidly occurring death from anaphylactic shock, the prime lesion is in the liver, consisting of engorgement with leucocytes, and haemorrhage into its substance; there is profound disturbance and death of the liver elements. This acute and fatal turmoil of the liver may be compared to that occurring in late chloroform poisoning and in the eclampsia of pregnancy. A similar engorgement of the lungs occurs, becoming more and more marked the longer the patient lives; death results from oedema of the lungs.

These deaths, appallingly sudden and unexpected and regrettable, merge, however, into insignificance when one reflects on the enormous saving of life by the use of various serum injections—for example, tetanus in the great war, and diphtheria in civil life; the risk to life is less than that of the most trivial surgical operation.

Doubtless in process of time the vehicle of the antibody content—the horse serum—will be modified in some way to prevent any chance of anaphylaxis occurring, whether by using some other less toxic animal serum or by adding some protective bodies to give it a colloidal character.

Till such a time a preliminary intravenous injection of 1/2 c.cm. of the 10 per cent. diluted serum and, if no adverse symptoms arise in an hour, the subcutaneous injection of the remainder of the dose should eliminate the possibility of anaphylactic disaster; a preliminary intravenous injection of sodium carbonate 5 grains, gum arabic 1 drachm, glucose 1 drachm, in normal saline solution up to 30 c.cm., together with an intramuscular injection of a sterile solution of 1 grain of calcium chloride dissolved in 10 minims of normal saline solution an hour before the serum injection, should also do away with any chance of anaphylaxis.

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[1] Dean: Case of Anaphylactic Shock, *Journ. of Path. and Bact.*, July, 1922, vol. xxv, No. 3.

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[3] Weil: Study in Anaphylaxis—XXI, Anaphylaxis in dogs; a study of the liver in shock and in peptone poisoning. *Journ. of Immunology*, 1917, vol. ii, p. 525. Weil and Fggleston: Also vol. ii, p. 571. Richet: *Anaphylaxis*. Liverpool University Press, and Constable and Co., London, 1913, p. 32.

AMPUTATION AT THE SHOULDER.

BY

F. R. PARAKH, M.D., M.R.C.S.,

CONSULTING SURGEON TO THE SURAT GENERAL HOSPITAL, INDIA.

DURING the last eighteen months I have seen three cases of rapidly growing endosteal sarcomas of the upper end of the humerus, growing into the shoulder-joint, and with distinct enlargement of the axillary glands, which required immediate and complete amputation. In the first two cases I followed the old and recognized method of first dividing the clavicle for ligature of the main vessels and exposure of the cervical plexus, before proceeding with the interscapulo thoracic amputation. In the first case, which was one of a very thin and emaciated male, I had some difficulty in getting at the main vessels, although I had taken good care to remove as much of the clavicle as circumstances demanded. It took me nearly thirty-five minutes to do this part of the operation, and I was disappointed at the time lost in this preliminary step. The second patient was a well developed young man weighing 155 lb. The operation was commenced in the usual way, and many difficulties were encountered in satisfactorily exposing the vessels and plexus. It took me nearly two and a half hours to complete the operation, and, possibly owing to the length of time and the shock of the operation itself, the patient died four hours after the operation.

In July, 1922, the third case was admitted to hospital, and, as previous experience of the two former operations was anything but happy, I made up my mind not to divide the clavicle, but to try to ligate the vessels as the first step of the operation. As the growth was much more marked in the front than the back and invading the joint, I made a large flap, commencing from the clavicle near the sterno-mastoid attachment, carried it along the axillary border of the scapula down to its angle, divided the muscular attachments of the scapula, and, as the whole extremity fell forwards of its own weight, there was very little difficulty in getting at the deep vessels, with which I immediately dealt. The whole operation did not last more than fifty minutes and was done with comparative ease.

I must confess that I had never heard nor read of the above method of doing the operation until, soon after my third operation, I received the BRITISH MEDICAL JOURNAL of March 11th, 1922, and I was gratified to find on page 381 an article describing more or less exactly the above procedure by no less an authority than the late Mr. H. Littlewood. With me it was only a case of necessity being the mother of invention, without any previous experience of such dissection either on the cadaver or the living subject.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

DERMATITIS FROM DYED FUR.

A CURRENT epidemic of "fur dermatitis" among out-patients is worthy of notice.

Except for degree of reaction, the type of dermatitis has not varied, and the patients mostly entered the department with its etiology on their shoulders. The eruption was limited to the lateral aspects of the neck and to the chin, but in one case the mucous membrane of the lips was dry and cracked, and in another, after three months of facial involvement, the reaction had spread to the forearms. A greater or less degree of oedema of the eyelids was, or had been, present in all the cases. This is a common and well recognized symptom of dermatitis artefacta from the use of hair dyes.

The eruption consisted of a blotchy erythema, limited in the early cases to the lateral aspects of the neck and face, but spreading thence, in cases of over a month's duration, to the whole of these areas, and resulting in considerable oedema and disfigurement. The later cases showed pronounced infiltration, with a tendency to vesiculation and "weeping." Itching and burning were complained of in a degree transcending the clinical manifestations, and in one case had prevented sleep for several nights.

The diagnosis from seborrhoeic dermatitis—the only dermatosis at all resembling it—rested on the localization, the absence of scalp involvement, and the history. In every case the direct association by contact of the fur collar with the neck and chin could be demonstrated, and none of the patients had ever suffered from "eczema" antecedent to their purchase of the coat. Further support to the diagnosis was obtained in two cases by applying a scrap of the fur under strapping plaster (and against a control) to the anterior aspect of the thigh. Erythema occurred in both subjects of the experiment where the fur was applied within twenty-four hours of the application.

The coats responsible all had fur collars of a dark flat variety, of very poor quality, and known to the trade as "dyed coney." It is probably rabbit fur dyed by one of the paraphenylendiamine group of textile dyes. A sample has been submitted to expert investigation, and an attempt to trace the place of manufacture will be made.

London, W. HENRY C. SEMON, M.D.

TRAUMA AND APPENDICITIS.

WHILST visiting a patient I was requested to examine a boy belonging to the same household. I was informed that three days previously he was struck in the abdomen by a perambulator, and that since then he had complained of violent pain. The high temperature, rapid pulse, tenderness over McBurney's point, and rigidity of the right rectus muscle gave me the impression that the boy was suffering from appendicitis. I visited him early the following morning and found that the temperature was still high and the pulse very rapid, and in addition he was doubled up with pain. I advised removal to hospital, where he was operated upon that afternoon. Laparotomy revealed a gangrenous condition of the appendix. Recovery was retarded by an attack of bronchopneumonia; but eventually the boy left hospital fit and well.

Derby. H. W. WILD, M.B.

Reports of Societies.

THE VALUE OF LABORATORY INVESTIGATION IN DISEASES OF LIVER AND PANCREAS.

A DISCUSSION on the value of laboratory investigation in diseases of the liver (including the biliary system) and of the pancreas took place at the meeting of the Medical Society of London on March 12th. Lord DAWSON OF PENN presided, and the discussion was opened by Dr. W. LANGDON BROWN with a paper which is printed in full at page 461.

Dr. F. LANGMEAD, after a reference to Dr. Langdon Brown's excellent and exhaustive treatment of the subject, said that he himself had approached this matter in the endeavour to apply laboratory tests to the elucidation of the cases which came forward in ordinary hospital practice, and to gauge to what extent these tests might form part of the practitioner's armamentarium. At the outset the number of the tests was a disadvantage; in medicine numbers were a weakness, not a strength. If by the "value" of this investigation the immediate practical usefulness of the laboratory test was intended, it must be confessed that, excluding the blood-sugar estimation in suspected or true diabetes, the tests had at the moment little usefulness from the point of view of ordinary diagnosis. With the exception just mentioned, he could not recall any instances within his own experience in which a laboratory test for the efficiency of the liver or the pancreas had provided him with a correct diagnosis which otherwise would have been missed. He did not mean that the test usually failed to correspond with the clinical findings, only that one was never first put upon the right track by means of the test. Discussing the tests individually, he said that the diastase content of the urine was a test which was losing rather than gaining adherents. The fat content of the stools was more helpful, but it could not be relied upon to decide, save in a case of obstructive jaundice, in what organ lay the disease. The levulose test was applicable mainly to acute destruction of the liver cells, and could not be depended on for chronic cases. He would be sorry to appear to speak disparagingly of tests so scientifically worked out, but there was a danger of the efficiency test being accepted as a kind of "ready reckoner," and he held strongly that the investigation was not sufficiently matured to permit of this.

Dr. J. W. MCNEE was very much in agreement with Dr. Langmead. The subject was still only at its beginning, and the time was not ripe for a full-dress discussion. It was obvious that no one test could give information in more than one or two directions. The levulose test, for example, had

definite value only in acute conditions of the liver—in cases in which there was hepatitis or toxic damage of the liver cells; the usefulness of the lipase test also was confined to cases of acute damage, and in more chronic hepatic diseases had nothing like the same value. He was extremely doubtful as to tests which involved the use of Einhorn's tube for taking out the contents of the duodenum. With regard to tests which concerned the pigmentary metabolism of the liver, he had been doing a good deal of work on van den Bergh's test for distinguishing obstructive and toxic jaundice. The chief value of this test in hepatic diseases was that it had transferred the general idea with regard to bile pigments away from the urine and faeces back to the blood. This had opened up a view of latent jaundice which had definite value. With regard to its direct application in practice to clinical cases, all he could say was that when there was complete direct reaction he had never had any difficulty; cases in which there had been complete indirect reaction had been either cases of haemolytic jaundice or of catarrhal jaundice, but not all the latter gave this reaction. At first he thought that all cases of catarrhal jaundice would give the indirect reaction, but he had found that this was not so. His conclusion was that none of these tests alone provided much information of value, though some of them might be useful.

Dr. MACKENZIE WALLIS agreed that no one test would give any valuable information. Only by a combination of tests could information of value be obtained. The most positive results were obtained in acute injuries to liver and pancreas. The investigation of salvarsan jaundice furnished an opportunity of applying the various tests and working out their relative values. The results he had himself obtained in salvarsan injections led him to recognize that the levulose tolerance test had the advantage of being extraordinarily accurate and delicate; it gave evidence of liver injury which no other test could furnish. Its disadvantage was the time it occupied, but a simplified method had been worked out. Another test which yielded interesting results in salvarsan cases was the lipase content of the serum. This by itself was of little value because it was not so delicate as the levulose test, and when it was positive it signified that considerable damage to the kidney cells had taken place. Like other speakers, he was sceptical of the Einhorn tube method of investigating biliary function. With regard to tests for pancreatic inefficiency, he drew attention to an investigation which he and Mr. H. E. Griffiths had made on gall stones. A large number of cases, both obvious and obscure, were investigated, and as many tests as possible were applied. These were particularly favourable cases to investigate from the point of view both of liver function and of pancreatic function, because they mostly came to operation, and there was no possibility of further appeal, for either they had stones in the gall bladder or they had not, so that the diagnosis, whether based on clinical or laboratory findings, was either proved or disproved. In a large number of cases of gall stones he and his colleague found that there was hyperchlorhydria with regurgitation. The lipase content of the blood was raised in some and normal in others; diastase in the urine was considerably raised in several. In conclusion, he emphasized the importance of not placing reliance on one test alone. One test taken by itself would often give false results. If these tests had not been of value in diagnosis, at least they had been useful in the scientific investigation of problems connected with hepatic and pancreatic function.

Dr. E. C. DODDS thought that the majority of workers were too apt to ignore the physiology of the liver when dealing with these problems. The recent researches of Mann had shown that four-fifths of the liver in animals might be removed without any symptoms beyond transitory shock. Apart from disturbances due to operative interference and interference with external secretions, there was little or no ill effect experienced from destruction of the liver until almost the whole had been removed. Unfortunately the majority of reactions for liver efficiency did not seem to give any idea with regard to the prognosis or the seriousness of the lesion. In his own experience one of the most valuable tests was that which depended upon the action of the liver in forming glycuronic acid with compounds such as camphor.

Dr. G. A. HARRISON said that in acute or subacute pancreatic disease the diastase test had been most useful, but generally it was of no assistance in chronic lesions. With regard to the tests of liver efficiency, most of the cases he had been asked to investigate had gross clinical signs, and from the clinician's point of view the test generally gave but little assistance. The point that had struck him most was the frequency of coincident disease of liver and pancreas—so much so that he had made it a rule to test the efficiency of both organs. Unfortunately it was difficult to test one organ to the exclusion of the other. The new levulose test might be affected by deficiency of the internal secretion of the pancreas, and one could not be absolutely certain as to what it meant. Van den Bergh's test was a laboratory test of real value, but only when its results were taken in association with other findings. All the tests must be weighed carefully in conjunction with clinical evidence; they should be regarded as an extension of the clinical examination, not in any respect as a substitute for it.

Mr. H. E. GRIFFITHS regarded it as unlikely that one infallible test would be found for a disease of one organ. The greatest value of the laboratory test was to confirm the clinician's findings, interpreting some of them, and guiding him in his search for further signs. The value of the duodenal tube had been rather decried that evening, but occasionally it was of definite assistance. It had never been suggested that the injection of magnesium sulphate (25 per cent. solution) directly into the duodenum through the tube was of itself likely to be of great assistance; what it did was to accelerate the bile down into the duodenum. By this method the bile might be brought into the duodenum within ten minutes. The value of the duodenal tube in carcinoma of the head of the pancreas was in showing the absolute absence of bile even after the injection of magnesium sulphate. The value of diastase in acute pancreatitis had been very generally accepted. This reaction might be carried out within half an hour, and therefore it was a test applicable to acute cases.

The discussion concluded with a few remarks in French by Dr. A. MATTHIEU DE FOSSEY of Vichy. Dr. de Fossey emphasized the importance of relying upon the findings of several tests, and not of one only, and especially the importance of blood tests in preference to urinary tests.

SPASTIC PARALYSIS.

A MEETING of the Orthopaedic Section of the Royal Society of Medicine was held on March 6th, with Mr. T. H. OPENSHAW in the chair. Mr. A. S. BLUNDELL BANKART read a paper on the operative treatment of spastic paralysis.

Mr. BANKART said that spastic paralysis was due to a permanent defect of the upper motor neurone. Such defects were the cerebral palsies of children, resulting in diplegias, hemiplegias, paraplegias, and monoplegias. The condition was essentially incurable. Treatment must be symptomatic, and directed to the relief of contractures. Of these perhaps the most important were plantar flexion of the foot (spastic equinus), flexion of the knee, adduction of the thigh, pronation of the forearm, and flexion of the wrist. It should not be forgotten that spastic paralysis was often accompanied by mental deficiency, motor weakness, or involuntary movements; and these had an important bearing on prognosis and treatment.

The nature of the spastic contracture was a tonic spinal reflex. Fortunately secondary anatomical or structural shortening usually occurred late. The treatment for such muscular shortening was by a direct attack on the shortened muscle. There were several methods of operative treatment for the physiological contractures, which were now under discussion. Non-operative treatment was useless. Foerster by posterior root section attacked the afferent side of the reflex arc. Mr. Bankart believed the results by this procedure were generally disappointing, perhaps because the contractures were local, and it was impossible to localize the effects of posterior root section. Again, orthopaedic surgeons could attempt to diminish the effective action of the preponderating muscle group through either muscle or nerve. This was an attack on the efferent side of the reflex arc. The older orthopaedic methods included such operations as division or exsection of portions of the adductors, division or exsection of portions of the hamstrings, and lengthening of the tendo Achillis. These were all needlessly complicated. There was a tendency for the contracture to recur, and there was the terribly long convalescence during which instruments had to be used.

Much simpler was Stöffel's operation of dividing fibres of the peripheral nerves. This abolished excessive muscular contraction by diminishing the number of muscle fibres taking part in the contraction. Amongst such typical operations might be cited those for adduction contracture, for flexion contracture of the knee, for spastic equinus, and

for pronation-flexion contracture of the forearm and wrist, whilst atypical operations of the same type were those for flexion spasm of the toes, for peroneal spasm, and for internal rotation of the thigh. The result of such nerve destruction was immediate and permanent flaccid paralysis of the muscle fibres involved. There was no tendency for these fibres to shorten; rather they tended to stretch. There was therefore no recurrence of the contracture, and prolonged after-treatment, abduction frames or splints, and the barbarous walking instruments so commonly seen were avoided.

In considering the end-results of Stöffel's operation, it should be remembered that spasticity was but one of the disabilities of cerebral paralysis. Treatment was necessarily limited, but by this method these terribly handicapped little ones could at any rate be made to walk, although imperfectly. In conclusion, Mr. Bankart said that Stöffel's operation was by far the best method yet devised for the treatment of pure spastic contracture. The operation was easy of performance, it was easily adjusted to individual cases, and the results were immediate and permanent.

Mr. LAMING EVANS considered adductor spasm well treated by division of the obturator nerve. He asked: Should one or both branches be divided?

Mr. FAIRBANK thought that it was very necessary to select the operation. If, for instance, in equinus there was real shortening of the calf muscles, Stöffel's operation was unsuitable. Elongation of the tendo Achillis was necessary. In flexion contracture of the knee the method was admissible. He agreed that Foerster's operation gave very poor results.

Mr. BRISTOW believed that division of the obturator nerve was admissible for adductor spasm. The question of the whole or partial division of the nerve was not important, since the adductor magnus would still be acting.

Mr. ELMSLIE stressed the necessity for certain diagnosis. Congenital syphilis often simulated spastic paralysis. He always had a Wassermann reaction taken before operating. Afterwards re-education was very necessary.

The PRESIDENT remarked that in ordinary hemiplegia there was a limitation of supination of the forearm and of rotation of the arm outwards. He was accustomed to divide the pronator radii teres muscle and the subscapular muscle, with excellent results.

MENSTRUATION AND PREGNANCY IN HODGKIN'S DISEASE.

A MEETING of the Liverpool Medical Institution was held on March 1st, with the President, Professor J. HILL ABRAM, in the chair, when Dr. ARTHUR GEMMELL read a note on menstruation and pregnancy in Hodgkin's disease.

Dr. Gemmell described a case of Hodgkin's disease commencing in the second month of the second pregnancy of a young married woman, aged 23, who came under notice in 1919.

The diagnosis was established by pathological examination of one of the glands, and treatment with arsenic and extract of lymphatic gland, with the application of x rays to the site of glandular enlargement, was commenced and continued throughout pregnancy. The labour and puerperium were normal. Under further treatment all traces of glandular involvement disappeared. A third pregnancy commenced in 1920 and the glands began to enlarge at the eighth week. The patient then contracted influenza and aborted. Treatment as before caused complete disappearance of the swellings in a few weeks. Her fourth gestation began in the spring of 1922 and the glands enlarged when she was about eighteen weeks pregnant, but treatment as before kept the disease in check, and she had a normal labour and puerperium with a healthy living child.

Little had been written on the relationship of Hodgkin's disease to menstruation and pregnancy. A collection was made of 57 cases in the female from the Liverpool hospitals and the literature. In 17 cases between puberty and the menopause whose menstrual history was obtained, 14 showed varying degrees of oligomenorrhoea of varying degrees even up to complete amenorrhoea, and 3 were unchanged. Of the 10 definitely parous women, 6 dated the onset of their disease from a pregnancy. Twenty-five cases of the series (43.8 per cent.) had their onset in periods of physiological amenorrhoea. Considering the above with the well known opinion that women were less liable to the disease than men, it was suggested that it was the ovarian hormone which conferred this relative immunity on women and that they only contracted the disease when there was a hypofunction of the ovary as regards its internal secretion. This hypofunction might be true, as before puberty or after the menopause, or relative, as during pregnancy. The corollary to this suggestion was that ovarian extract should be given in addition to the treatment already mentioned. *Post-mortem* notes on the genitalia were only available in four cases and these supported that view. Notes on the labours and puerperia were available only in six cases. These showed that, on the whole, labours were normal with a tendency to *post-partum* haemorrhage; but three of the patients died within three months of labour. No abortions were definitely attributable to the disease. It appeared that where early Hodgkin's disease and early pregnancy occurred together the uterus should be emptied and the woman warned of the danger of future pregnancies. Dr. Gemmell drew the following conclusions: (1) Possibly Hodgkin's disease occurred, in the female, when there was a hypofunction of the ovary. (2) Diminution in the menstrual flow was a symptom of Hodgkin's disease. (3) Where early Hodgkin's disease and early pregnancy occurred together, the pregnancy should be terminated.

Osteitis Deformans.

Dr. WALLACE JONES read a note on a case of osteitis deformans, of which Dr. THURSTAN HOLLAND showed radiographs. The case was that of a man who commenced four years ago with pain in legs and muscular weakness, which was thought to follow a slight accident to the hip. There was no family history of similar disease. He had lost two inches in height, and the size of his hat had increased from 6⅞ to 7¼ inches. He had a hunchback appearance with kyphosis and marked bowing of both tibiae. The movements of both hip-joints were limited. The arteries were thickened. Dr. Thurstan Holland showed a series of lantern slides showing the condition of various bones, including the skull. These showed the typical changes in the x-ray appearances caused by the various degrees of the combined rarefying and proliferation.

Oxycephaly.

Dr. HENRY COHEN read a note on oxycephaly, illustrating the characteristic features of the condition by photographs and radiograms of three cases which had come under his observation. He emphasized the pressure origin of the so-called "digital markings" by comparing them with the appearances seen in hydrocephalus and brain tumour. In addition to the usual eye signs, congenital cataract was present in a case of scaphocephaly. Dr. NORMAN CAPON believed that the convolutional impressions were due to disordered bone development rather than to pressure. Somewhat similar impressions were found in craniotabes, and when they occurred in hydrocephalus it was to be expected that the small volume of liquid lying between the external surface of the brain and the internal surface of the cranial bones would nullify direct pressure as the cause.

Appendicitis.

Mr. ROBERT KENNON read a paper on appendicitis as a possible epidemic disease. In support of this he urged that whereas the yearly mortality in the Liverpool Royal Infirmary for the past five years had averaged 6.2 per cent. for acute cases, a study of the monthly admissions showed more cases admitted from May to October, and while periods of six months might elapse without a death, on four occasions the monthly mortality reached 33 per cent. Cases admitted in 1921 were greater in number, of greater pathological virulence (abscess formation 55 per cent. against 33 per cent. in other years), and had a higher mortality, especially in the month of June. The mortality curves and incidence curves of hospital and general practice bore no relation to influenza, but followed other streptococcal diseases such as rheumatic fever, erysipelas and puerperal fever, less so scarlet fever. Liverpool had a lower death rate from appendicitis than Manchester, Birmingham, and Leeds, when the population was considered.

GYNAECOLOGICAL CASES AND SPECIMENS.

A MEETING of the North of England Obstetrical and Gynaecological Society was held in the Liverpool Medical Institution on February 16th, with Professor W. BLAIR BELL in the chair, when a number of specimens were shown and interesting cases recorded and discussed.

Drs. LEITH MURRAY and MEREDITH LITTLER presented a final report on their case of "mixed tumour" of the uterus (adeno-chondro-sarcoma), reported in full in the *Journal of Obstetrics and Gynaecology of the British Empire* in January, 1914. The patient, more than nine years after operation, was alive and well.

Drs. RUTH NICHOLSON and PICKERING JONES showed a 38-weeks female foetus with numerous abnormalities—achondroplasia, general oedema and ascites, transposition of viscera, supernumerary spleniculi and digits, dilatation of ureters, and under-developed ovaries. The histological appearances in the liver, etc., suggested the further condition of leukaemia. Dr. N. B. CAPON pointed out that the changes suggestive of leukaemia were commonly found in foetuses with oedema and ascites, and were probably associated therewith.

Dr. J. H. WILLETT showed a specimen of repeated ectopic gestation with intraperitoneal rupture.

Nine years ago the patient was operated upon for perforated gastric ulcer; pelvic stab drainage was required and she was in hospital for twelve weeks. Five years ago Dr. Willett operated for right-sided ectopic gestation and removed the tube; dense adhesions were found in the pelvis, the left tube was freed, found healthy, and conserved. Menstrual regularity followed until September 29th, 1922; on November 10th there was a slight bleeding, and on the 27th an abdominal crisis, from which the patient rallied. The abdomen was reopened on December 1st, and a ruptured ampullary gestation was found on the left side; the embryo, placenta, and clots were free in the pelvis, and salpingectomy was performed. Dr. Willett considered that the pelvic adhesions were the probable cause of kinking of the tube and arrest of the ovum. He pointed out the rarity of primary intraperitoneal rupture of ampullary gestations and suggested blocking of the abdominal ostium had occurred with resulting increased tension.

Dr. D. DOUGAL showed an adenomyoma of the vermiform appendix, the tip of which was coiled and adherent in the pelvis near to, but not in contact with, the right ovary. Typical endometrium was found in the wall of the appendix; the section of ovary examined was suggestive of adenomyoma.

Professor H. BRIGGS showed a case of fibroid which emphasized the value of Péan's work.

The vaginal route was demanded by a low-lying tumour and a weak pelvic floor, the removal of the one and the restoration of the other being effected within a single field of operation with the maximum of safety. The tumour, the uterus, and the appendages (bilateral hydrosalpinx) weighed 1½ lb.; weight and size indicated a piecemeal removal (Péan) or Professor Briggs's own alternative (published in 1898), of cutting the tumour into a connected, chain-like column, easily brought down. Free cutting into a fibroid drained away blood and serum and reduced the average total weight by one-fifth.

Miss IVENS showed a submucous fibromyoma removed by myomectomy.

A solitary fibroid in the anterior uterine wall in a young woman aged 22 was a condition which appealed strongly for conservative treatment. The patient had a history of six weeks' profuse irregular haemorrhages, with clots and abdominal pain; a tender smooth swelling, the size of an orange, was continuous with the cervix. The tumour with the subjacent mucosa was removed through an anterior vertical incision; careful suture of the musculature brought the mucosa into close apposition not requiring separate suture. A year later the patient was in good health. On section the tumour showed necrobiosis and hyaline changes.

Dr. FLETCHER SHAW read the notes of a case of fibromyoma of the cervix occurring after supravaginal hysterectomy and recurring after myomectomy.

The patient had supravaginal hysterectomy done and both appendages removed in 1917, on account of old inflammatory matting of the appendages, probably due to tuberculous trouble. Four years later she came under observation again because of persistent haemorrhage, and a fibroid was then found completely filling the pelvis and presenting at the cervix, which admitted two fingers. This was removed by abdominal myomectomy and the cervix left behind, as it was so adherent to the side of the pelvis that removal would have been an extremely difficult operation. Five months later she returned with another hard mass in the pelvis and this was treated with *x* rays; after twelve months it had slightly diminished in size, and there had been no haemorrhage for six months. Microscopical examination showed the tumour removed by myomectomy to be a simple fibromyoma, though the early recurrence was suspicious of sarcoma; this, however, was unlikely in view of the slight reduction in size and the cessation of symptoms after *x*-ray treatment.

Dr. MILES H. PHILLIPS recorded a case of chronic inversion of the uterus which emphasized the value of Aveling's repositor.

A complete inversion of uterus and cervix was discovered four months after the confinement. After the necessary attention to the local toilet, the repositor was introduced and completed its work within twelve hours. Dr. Phillips had had two small holes bored through the head of the repositor to relieve the difficulty previously experienced in removing a repositor with a solid head, owing to suction between it and the uterus. This had been completely satisfactory. He further emphasized the slight pressure required, which was furnished by two rubber "paper bands."

Dr. LEITH MURRAY presented a case of "tarry cysts" of the ovary associated with subperitoneal adenomyoma.

The patient was 42 years of age, and had one child 8½ years old. She had had severe and increasing congestive dysmenorrhoea for five or six years; menses were usually scanty, occasionally profuse. Inflammatory appendage disease was diagnosed because of the fixation of the uterus with enlarged, tender, and somewhat cystic appendages. Operation revealed dense adhesions about a soft enlarged uterus, and the appendages much enlarged by tarry cysts; these burst during the subtotal hysterectomy and bilateral salpingo-oöphorectomy; the peritoneum over the bladder was slightly adherent to the anterior wall of the uterus. The uterus was 1½ inches thick at the fundus and 1 inch elsewhere; in the anterior wall, near the fundus and rather to the left of the middle line, was a rounded, pale nodule, half an inch in diameter; this was obvious as soon as the abdomen was opened, and was certainly not adherent to either appendage. It was slightly raised and, on section, had no capsule. This nodule showed microscopically a definite adenomyomatous stroma, was without a capsule, and without any evidence of tuberculous granuloma or of the inclusion of the interstitial part of a Fallopian tube. Definite adenomatous elements of endometrial type were found in each ovary. The endometrium was oedematous and polypoid. Without question there was no direct extension of an adenomatous process from the ovary to the uterus by way of adhesion. Dr. Murray had never before seen a subperitoneal adenoma so definitely situated in the uterine wall. He was tempted to wonder whether too much had not been made of an obvious similarity between the glands and surrounding stroma of extrauterine adenomata and the endometrium proper. A case such as this seemed to lend some basis for Meyer's view that those growths are more correctly entitled "adenomatoses."

CAUTERIZATION OF PLEURAL ADHESIONS BY THORACOSCOPY.

A MEETING of the Aberdeen Medico-Chirurgical Society was held on March 8th, with the President, Dr. ALEXANDER OGSTON, in the chair, when Dr. JAMES LAWSON (Tor-na-Dee Sanatorium) demonstrated a case of cauterization of pleural adhesions by thoracoscopy, illustrated by skiagrams. The patient suffered from pulmonary tuberculosis affecting practically the whole of the right lung. An artificial pneumothorax was induced on that side, but complete collapse of the lung was prevented by adhesions in the region of the upper lobe and of the diaphragm. The thoracoscope was inserted into the pneumothorax cavity in the sixth space in the scapular line and the adhesions inspected. The upper adhesion was found to be too extensive for cauterization; the lower adhesion was divided by the cautery passed through another cannula inserted in the sixth space in the anterior axillary line, the action of the cautery being controlled by inspection through the thoracoscope. Local anaesthesia only was employed. Following this operation there was a considerable increase in the amount of collapse of the lung, though not so much as would have followed had it been possible to deal with the upper adhesion also. Dr. Lawson described briefly the difficulties of the operation, showed the patient, and demonstrated the instruments required, with skiagrams of the case. A short discussion followed, in which Professor ASHLEY MACKINTOSH, Mr. F. K. SMITH, and the PRESIDENT took part.

Parham's Bands.

Mr. F. K. SMITH then gave a short paper, with lantern illustrations, on the treatment of fractures by Parham's bands. Mr. Smith pointed out that any method which reduced the loss of working time in a fracture case was worthy of trial; he indicated the disadvantages of different methods of fixation by open operation, and stated that he had found the following advantages of Parham's method: the ease of application, the comparatively small wound required, the small amount of manipulation necessary, and the better chance of aseptic healing. The cases in which this method had been found most suitable were those of oblique fractures, and often in comminuted fractures. In transverse fractures, bands alone were unsuitable, and should be combined with Sherman's plates. Mr. Smith demonstrated the special instruments used, and showed a series of lantern slides of skiagrams of eight cases before and after operation. In the subsequent discussion, Professor MARNOCH, Mr. DON, Mr. MITCHELL, Dr. ROSE, and the PRESIDENT took part.

Statistics of Appendicitis.

Mr. G. H. COLT read a paper on the results of the treatment of cases of acute appendicitis occurring in Professor Marnoch's wards in the Aberdeen Royal Infirmary from January, 1911, to December, 1921. There were 675 cases, of which 568 (84 per cent.) were operated on within twenty-

four hours of admission and 107 were kept under observation; 92 of the latter were subsequently operated on without mortality, a definite lesion of the appendix being found in all of them. The mortality in the 568 cases operated on immediately was 6.3 per cent., but excluding 7 cases of wrong diagnosis, with two deaths (one being a case of volvulus and one a case of small ovarian cyst from which streptococci were isolated), the mortality was 6.07 per cent. In 94 cases without pus the mortality was 1.06 per cent. of those drained, and in 165 cases without pus, not drained, 1.81 per cent. In 170 gangrenous cases the mortality was 8.82 per cent., in 62 perforated cases 11.3 per cent., and in 99 abscess cases 3.03 per cent. The chief conclusions were as follows: (1) About 84 per cent. of acute cases required urgent operation; (2) about 90 per cent. of all cases requiring urgent operation would suffer primary appendicectomy; and (3) when pus appeared in a gangrenous case the risk rose from about 2.4 per cent. to 8.8 per cent., and in some third-day cases to double this, the risk rising geometrically as the time increased arithmetically. Professor MARNOCH and Mr. SMITH contributed to the discussion, and some interesting remarks from the statistical point of view were made by Dr. J. F. TOCHER.

PNEUMONIA AND ITS COMPLICATIONS.

AT a meeting of the Brighton and Sussex Medico-Chirurgical Society on March 1st, with Dr. D. W. LIVINGSTONE, the Vice-President, in the chair, Dr. WALTER BROADBENT read a paper on pneumonia and its complications.

Dr. Broadbent remarked that physical signs might not be evident for a day or two after the onset. In was in those cases that a right-sided pneumonia might be confused with appendicitis (especially if there was some inaudible diaphragmatic pleurisy giving rise to pain and rigidity of the abdominal wall), but respirations would be rapid and breath sounds weaker than normal, and there would be no tenderness per rectum. A low temperature in a case with extensive physical signs usually meant deficient resistance, as also did a rapid or intermittent pulse. In favourable cases there was a marked leucocytosis. He described haemorrhagic and oedematous types of pneumonia, which occurred in influenza epidemics. He advised that pleuritic fluid should not be drawn off till after the fall of the temperature unless there was embarrassment of the heart. Empyema was the most common complication. In children breath sounds could often be heard through pus, so it might be missed. Interlobar empyema was difficult to diagnose as every case differed. There might be dullness in the second and third spaces in front, or at the level of the spine of the scapula behind. There was generally bronchial breathing in the upper lobe and a varying degree of signs of compression of the lower lobe. The best place for operating was in the upper axilla with the arm raised. He had made the diagnosis in five cases, four being cured by operation. Dr. Broadbent described a case of empyema between the mediastinum and the left lung, which was collapsed and adherent to the chest wall. In operating the surgeon removed a portion of the eighth rib just external to its angle. Another case had an empyema between the base of the right lung and the diaphragm, which was found by a dull area three inches broad over the lower ribs in the posterior axillary region. He described a case of suppuration of bronchial glands after a very severe pneumonia. It was characterized by spasmodic cough lasting for hours, by dullness in the second right space and under the sternum, and by displacement of the heart to the left. Recovery took place after the sudden coughing up of half an ounce or more of pus. Ulcerative endocarditis might be set up by the pneumococcus; one such case with pyrexia, showers of small emboli in the lower legs and forearms, occasional infarcts in the lungs, and intermittent albuminuria had been cured by Dr. Helen Boyle and himself by numerous injections of antipneumococcic serum continued in spite of severe anaphylaxis. Meningitis occurred mostly in young children. It was usually fatal, but he had had two cures by daily lumbar puncture, frequent injections of serum, and large doses of urotropin. In one of them the cerebrospinal fluid resembled empyema pus.

In regard to treatment he was strongly of opinion that the patient should be moved as little as possible by nurses, since auto-inoculation occurred so readily. For lobar pneumonia with high temperature he thought the ice-bag good. Vaccines, if of the right type of pneumococcus, were useful if given on the first or second day. In delayed resolution and after empyema autogenous vaccines hastened cure. He had excellent results from the use of the Pasteur Institute antipneumococcic serum, and also from Pane's serum. Medicinally he thought aspirin and quinine valuable, also the creosote and potassium iodide mixture, and for extremely poisoned cases Warburg's tincture. If the pulse rate was up to 100 digitalis should be given, and if up to 120 hypodermic injections of strophanthin; camphor hypodermically was valuable.

Nerve Implantation in Facial Paralysis.

Mr. H. F. SEYMOUR then showed a case of facial-hypoglossal implantation for facial paralysis.

He said that a boy, aged 11, had been treated for chronic otitis media of long standing of the right side for about a month without success. A radical mastoid operation was then performed. Facial paralysis came on three days later (although the facial nerve had not been injured at the operation), and recovery did not take place even after five months in spite of massage and electrical treatment. An implantation of the facial into the hypoglossal nerve was then undertaken. The operation was difficult, there being some enlarged lymphatic glands just below the tip of the mastoid process. In clearing these out the nerve was found to be bound up in the connective tissue of the periadenitis, as it came out of the stylo-mastoid foramen. Consequently the trunk of the nerve had to be found at the entry of the parotid gland, where it was completely divided. Having dissected it out and isolated the hypoglossal, a nick was made into the latter and the facial trunk drawn by fine catgut sutures into the former. Assured of no undue tension, the junction was buried in the posterior belly of the digastric muscle. Five months passed before any recovery was noticed, the patient then beginning to use the risorius muscle, the levator labii superioris and orbicularis oris coming into action once more. The eye was shown to shut quite well, but the frontalis portion of the occipito-frontalis was still paralysed, and there was no sense of taste on the right-hand side of the tongue anteriorly from permanent destruction of the chorda tympani branch on this side. The tongue moved normally and the movements were daily improving, and the expression of the face on smiling was practically normal. Mr. Seymour discussed the advantages of using the hypoglossal nerve for this purpose instead of the spinal accessory.

ELEVATION OF THE DIAPHRAGM DUE TO UNILATERAL PHRENIC PARALYSIS.

AT a meeting of the Röntgen Society on March 6th, Sir HUMPHRY ROLLESTON presiding, a paper was read by Dr. J. M. WOODBURN MORISON of Manchester on the elevation of the diaphragm and its connexion with unilateral phrenic paralysis.

Dr. Woodburn Morison said that certain forms of congenital elevation of the diaphragm were probably due to a unilateral phrenic paralysis, and he proceeded to give a radiological study of a number of cases. It was not uncommon, he said, for paralysis of the diaphragm to be caused by a definite lesion involving the phrenic nerve in its passage through the thorax, although little was to be found on the subject in radiological literature. In nine cases he discovered paralysis of either the left or right leaflet of the diaphragm, variously associated with secondary carcinoma, primary growth in the chest, tuberculosis, and aneurysm of the aorta. In all these cases the diaphragmatic movements on the affected side were reversed, and in two cases he was able to obtain *post-mortem* evidence to confirm the diagnosis of unilateral phrenic paralysis. He was convinced that when the phrenic nerve was paralysed the movements of the affected leaflet must be reversed unless the diaphragmatic movement were impeded altogether by reason of a new growth; and there was some evidence, which he recounted, in support of the theory that these cases were due to an injury of the phrenic nerve at birth which had remained for a long time latent.

Sir HUMPHRY ROLLESTON said that Dr. Morison had correlated three groups of cases. The first group consisted of the cases which were known as Petit's eventration, or which used to be spoken of as congenital or false diaphragmatic hernia. The question in his own mind had been as to whether these cases were not due to a congenital atrophy of the muscular fibre of the diaphragm, which might remain latent throughout life unless some such event as a stricture or twisting of the stomach took place. Dr. Morison had put forward the view that there was a definite cause for the atrophy of the diaphragm occurring very early in life, and it was certainly a remarkable fact that this congenital or false diaphragmatic hernia was so very much more common on the

left than on the right. The other two groups were those in which there was an injury or wound giving rise to the hernia, and those in which there was a definite paralysis of the phrenic nerve on one side.

Sir CHARLTON BRISCOE agreed that paralysis of the phrenic nerve was common. He had seen four cases *post mortem* in which the diaphragm was definitely paralysed and the phrenic nerve destroyed. These were cases mostly of new growths in the chest, and almost always on the left side. This condition was frequently missed in examinations during life because of the presence of fluid, and it was generally missed in the *post-mortem* room because trouble was not taken to dissect out the nerves, and the degenerated muscle showed very little difference from the normal muscle, often only a rather more brownish tinge and a lessened elasticity to the touch. There were no physical signs by which the paralysis of one-half of the diaphragm could be detected. It might be suspected very strongly, but there were no true physical signs, no alteration in the size of the chest, or of accessory muscular movements. Therefore the *x*-ray picture was of enormous value. There was one little sign in cases of paralysis of the left half of the diaphragm which was worth noting—namely, that at the end of inspiration there was a little tug of the mediastinum to the right. That seemed to be of great value when the general picture was obscured by fluid.

Sir ARCHIBALD REID said that he had one case in which what was almost certainly a congenital hernia was only discovered—by radiological means—when the patient was 40 years of age. The patient, who had had very acute symptoms for a short period, had been completely comfortable ever since the discovery of the anomaly.

Dr. ROBERT KNOX described a case in which a patient had a left-sided pleural effusion to begin with, and then suddenly developed marked dullness on the right side. On screen examination the diaphragm on the right side was observed to be at a high level. Later a tumour was discovered, which cleared up under *x* ray treatment, and with the clearing up of the tumour and the relief of the pressure the diaphragm recovered its normal movement.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING of the Royal Medico-Chirurgical Society of Glasgow was held on March 2nd. Dr. JAMES ADAM showed a case of laryngectomy done under local anaesthesia, and discussed shortly the question of anaesthesia in relation to operative mortality. Dr. Adam pointed out that shock, septic pneumonia, and mediastinitis are the three most important dangers to be guarded against in these operations. Continental surgeons have shown that these dangers are best guarded against by local rather than general anaesthesia; Dr. Adam described the operation performed successfully upon his patient, and demonstrated the result and the specimen.

Dr. W. S. SYME made a communication on surgical diathermy in the treatment of malignant disease of the throat, and showed several patients. One of these demonstrated the type of case treated and others the results obtained. Dr. Syme explained the procedure and detailed his operation in each case. The treatment was employed at first only for inoperable cases, but as experience of its use had enlarged it was being more and more recognized as applicable and preferable to the ordinary procedures for cases of malignant disease of the mouth and especially of the pharynx in all stages. The advantages appeared to be the following: The operation was practically bloodless, and no external operation was required to expose the growth in the majority of cases. Patients, too, recovered rapidly, even after a large removal.

Dr. G. H. STEVENSON made a communication on tendon transplantation for musculo-spiral paralysis, and showed patients. He discussed the relative values of nerve suture and tendon transplantation in a small group of wounded soldiers in the West of Scotland, and concluded that for rapidity of restoration of function the latter operation had points rendering it preferable to the former. He described the operation performed where certain of the flexor tendons were transplanted into extensor tendons sufficient to carry out ordinary movements of extension. Lastly, Dr. Stevenson explained the difficulties of after-treatment, showing simple splints devised to facilitate recovery of function, and showed several patients who had been treated by his method with remarkable results.

Reviews.

AN EDWARD NETTLESHIP MEMORIAL VOLUME.

THE one branch of medical science wherein the importance of hereditary studies has been fully appreciated, and wherein splendid work has been done during the last decade, is undoubtedly ophthalmology, and none can hesitate to admit that the main incentive was the inspiration provided by Edward Nettleship. The editor of the *Treasury of Human Inheritance*,[1] Professor Karl Pearson, who made a joint inquiry with Nettleship into albinism, came to the conclusion that Nettleship would himself have preferred as a memorial a record of work done by others as well as by himself. Professor Pearson has accordingly prepared a Nettleship Memorial Volume of the *Treasury* containing Nettleship's own work, that of his immediate students and friends, and that of other ophthalmologists who have contributed to the knowledge of hereditary diseases and anomalies of the eye.

The first part of the volume contains an account of the life of Nettleship written by Mr. J. B. LAWFORD, who had the privilege of a long and close association with Nettleship, and who confesses to "an unbounded admiration for the true nobility of his character and a deep appreciation of his warm-hearted and sympathetic nature." Nettleship was born in the country of a father who had been both a rector and a head master, and was a man of considerable intellectual power with a developed taste for poetry and music; and a mother who was noted for her vigour of character. Of his several brothers three besides himself became noted in their spheres of work. Although as a boy Nettleship's love of outdoor life marked him out for a farmer, he became a veterinary surgeon and a professor of veterinary surgery at Cirencester College. But he speedily became a Member and then a Fellow of the Royal College of Surgeons of England. At the London Hospital he worked for Jonathan Hutchinson and received an impress from that diligent investigator that remained with him for life. His bent was early to ophthalmology, and being attached as a student to Moorfields Eye Hospital, he became curator of the museum, and, after a period at the Royal Eye Hospital, a member of the surgical staff at Moorfields; and also the ophthalmic surgeon at St. Thomas's Hospital in succession to Liebreich. His diligence and method made his work successful whether as a hospital surgeon, as Dean of his school, as investigator of the eye conditions of the children at Poor Law schools, or in private practice. But at the height of his professional success he retired to Hindhead and devoted his time and energy to the study of heredity in disease. During the ten years that followed he accomplished a prodigious amount of work of a very high standard, "working in such a way that his researches are models of orderly observation and recording." He was elected F.R.S. in 1912 and the esteem and regard of his pupils was expressed by their collection of a fund which by his desire was devoted to the establishment of a medal "for the encouragement of scientific and ophthalmic work."

He was known to his brothers as "Bird-bearing Ned" on account of his devotion to natural history and particularly to bird life, and his love of Nature found full play in his home at Hindhead, in his garden and in the woods, with the birds, trees, and flowers of that beautiful spot. In the country he was born, in the country he loved to work, and in the country he died.

The main part of the volume is devoted to the consideration of retinitis pigmentosa and allied diseases. It is now well recognized that retinitis pigmentosa itself is a developmental defect, the exact nature of which is obscure. In congenital stationary night-blindness the case is different; both types of this condition are undoubtedly due to some congenital developmental defect, but nothing is known of the nature of the defect, and there is no reason other than convenience for grouping together the diseases which have the common symptom of night-blindness. A search in the works of early writers has failed to reveal anything more suggestive of the existence of this disease than the statement that night-blindness did not always respond to treatment and that it

[1] *The Treasury of Human Inheritance.* Eugenics Laboratory Memoirs, XXI. Francis Galton Laboratory for National Eugenics, London. Volume II: *Anomalies and Disease of the Eye* (Nettleship Memorial Volume). Part I: *Retinitis Pigmentosa and Allied Diseases; Congenital Stationary Night-Blindness; Glioma Retinae.* By Julia Bell, M.A., M.R.C.S., L.R.C.P. With a Memoir of Edward Nettleship by J. B. Lawford, LL.D., F.R.C.S. Cambridge University Press. 1922. (45s. net.)

might progress to the complete loss of sight. But the symptom of night-blindness has been recognized by writers of all ages in all countries, associated with many forms of malnutrition and exhaustion disease, and there was a common tendency to rely on the virtues of liver as a specific; a prescription for it as early as 1500 B.C. has been discovered in the famous "Book of the Eyes" found in the Theban Necropolis. Whether temporary night-blindness has any relation to the severer progressive retinitis pigmentosa, or whether normal members of stocks that suffer from the congenital defects are more liable than others to temporary affections, is a speculation of interest. The first certain record of hereditary disease is due to Ovelgün in 1744, but nothing more is found until 1830, when Richter described the affection in three of a sibship. Eight years later Cunier gave the famous Nougaret pedigree of six generations—a pedigree which was brought up to ten generations by Nettleship, who himself examined certain members of the family and showed that the affection was congenital night-blindness, and not retinitis pigmentosa. Pigmentation of the retina had been seen *post mortem* by Langenbeck in 1836, but the appearance was not correlated to night-blindness until seen by the ophthalmoscope. That instrument completely revolutionized the work of the ophthalmologist, though it is sad to have to admit that, so far as this group of disease is concerned, the benefit of the discovery is limited to the ophthalmologist and has contributed nothing to the relief of the patient.

Since cure is not to be expected, prevention becomes all-important, and therein lies the value of the knowledge of the conditions of inheritance. The signs and symptoms of the disease are very clearly and accurately set out in the pages of the volume, with citations of the writings of those who have contributed to our knowledge. Statistics are given of the known age of onset and the rate of progress of the limitation of sight. It may be accepted that the onset is at an early age in the great majority of cases, and is a rare occurrence after the age of 20 years; also it may be accepted that sight is very frequently lost before the age of 40 years. Opinion has for some time been almost unanimous that the disease should be regarded as of an atrophic or degenerative nature, but opinion is by no means agreed as to whether the degenerative process originates in the chorio-capillaris, the layer of the choroid which is entirely responsible for the nutrition of the outer layers of the retina; whether it originates in the nervous elements of the retina itself, manifesting first in the layer of rods and cones; or whether some defect of the retinal vessels precedes the degeneration of the nervous elements of the retina. Nettleship held the view that the chorio-capillaris was at fault, but recently some evidence has been given that the primary atrophy is of the retinal elements. No hypothesis seems to satisfy all conditions entirely, and many a "beautiful theory has been killed by a nasty little fact." In most forms of hereditary congenital defect it is common to find many associated defects. These are not common with retinitis pigmentosa; only two are found with any frequency—namely, deafness, often deaf-mutism, and idiocy or some type of mental defect or defect of the central nervous system. The condition occurs more or less uniformly in European countries; it is perhaps less frequent in America, and rare amongst negroes. It is said to be common in China, but not on very reliable evidence, and it is common in India. Consanguinity appears to have some influence, for with an increase in the percentage of consanguinity there appears to be an increase in the defect resulting. The male tends to become affected more readily than the female, but is less liable to transmit the disease to his offspring.

The section dealing with congenital stationary night-blindness illustrates the incompleteness of our knowledge of this rarer condition; indeed, it is by no means certain that the defect is in the eye at all, for so far it has not been found possible to make a microscopic examination of the eye of an affected person.

A most complete bibliography of the disease is provided, together with details of some 300 pedigrees, each illustrated by charts drawn on the *a* plan uniform with the Galton Laboratory system. It would be invidious to distinguish any part of the work more than another, yet some appreciation may be permitted of the fine collection of pedigrees by Usher of Aberdeen, who was one of Nettleship's most enthusiastic colleagues in the prosecution of this work.

Finally, there is a section dealing with that destructive form of eye disease known as glioma retinae. A new growth of the retina which occurs exclusively in very young children and is malignant in that it infiltrates surrounding tissues may extend by proliferation of the primary growth by continuity along the optic nerve to the brain or may be widely disseminated by means of the lymph channels or blood stream forming metastases in the glands, bones, or occasionally distant organs of the body. Thirty-six small family histories have been collected, giving records of 128 cases. There is no evidence of correlated defects of other kinds; consanguinity is not evident, and the data are insufficient to indicate any sex liability. But there is sufficient evidence of liability to hereditary continuance of the disease "to raise grave doubts as to whether any member of a sibship in which more than one member is affected ought to marry."

The whole work is prepared with the unsurpassable accuracy which marks all the productions of Professor Karl Pearson's laboratory, and the printing and make-up of the volume is a good example of the work of the University Press of Cambridge.

SYPHILIS OF THE INNOCENT.

Syphilis of the Innocent,[2] by Dr. HARRY C. SOLOMON and MAIDA HERMAN SOLOMON, is mainly concerned with the social side of this complicated and very important subject, though the purely medical aspects are by no means neglected. It is not the first book that has been written under the same or a similar title, for we have Bulkley's *Syphilis in the Innocent*, Fournier's *La Syphilis des Honnêtes Femmes*, and Scheuer's *Die Syphilis der Unschuldigen*. But no other title, so accurate and so expressive, could have been chosen. Of the three forms of innocent syphilis—conjugal syphilis acquired by the mate, congenital syphilis in the children, and extragenital syphilis—the first two, constituting genital innocent syphilis, have always been far the most numerous, and as yet there is little evidence that their number is diminishing; while the cases of extragenital syphilis have certainly decreased. The problem of extragenital syphilis as regards control and prevention is simple compared with that of innocent syphilis in the mate and children of a syphilitic marriage. And although all three divisions of innocent syphilis are dealt with in this volume, the authors devote much more space to the extraordinarily complicated subject of syphilis acquired by the spouse (in most cases the wife) and transmitted to the children. On this, nothing more striking, terse, and true has been said than Dechambre's words, that "syphilis is divided among husband and wife like the daily bread." The authors have done well to recover this French epigram, which indeed is so good as to deserve a place on the title-page of their second edition.

The plan of the book is clearly seen from the chapter headings, dealing with syphilis in the individual, the mate, the child, the family, and the community. Statistics from the large clinical material of the authors and from many other clinics in America and Europe are presented and compared, and the very numerous points raised are illustrated by 152 short records of cases. These clinical records bear the name and surname of the patient, but it is explained in a footnote, which might easily escape notice, that these names are fictitious and are given apparently to add colour to the narrative. These records certainly relieve and illuminate the tediousness of figures and percentages. The comparison is chiefly between Fournier's French statistics and those of various American clinics. Of syphilitic women, about 80 per cent. are married, and of these married women 75 per cent. have acquired it from the husband in Fournier's figures, while American statistics show a lower figure of 50 per cent. or less. It appears that the risks to the woman are much greater earlier than later in marriage, 86 per cent. of women acquiring syphilis from their husbands in the first year of marriage (Fournier). The authors present a study of the families of 555 syphilitic individuals, the majority of them in a late stage of the disease; out of these the Wassermann test was done in the mates in 336 cases (these were mostly women), and was positive in 30 per cent. and negative in 68 per cent. A very careful examination has been made of the children of these 555 syphilitic marriages; the percentage of barren marriages (30 per cent.), the percentage of living children giving a positive Wassermann test (8 to 16 per cent.), and the percentage of syphilitic pregnancies, including miscarriages and stillbirths (50 per

[2] *Syphilis of the Innocent: A Study of the Social Effects of Syphilis on the Family and the Community. With 152 Illustrative Cases.* By Harry C. Solomon, B.S., M.D., and Maida Herman Solomon, A.B., B.S. Washington: United States Interdepartmental Social Hygienic Board. 1922. (Med. 8vo, pp. iv + 239.)

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In another 270 pages the treatment of surgical tuberculosis and some other infections is dealt with on conservative orthopaedic lines, with which open-air hospitals have made us familiar in this country as well as abroad. For injection of abscesses after aspiration Dr. Privat uses a mixture of olive oil, ether, creosote, guaiacol, and iodoform, but he does not attach very great importance to the composition of this fluid. In cases of inspissation of pus in chronic abscess he recommends a liquefying injection. Methods of correcting ankylosis in bad functional position are recommended and described.

The third part of the book treats of congenital affections, such as wry-neck, dislocation of hip, and club-foot. The fourth part, on infantile paralysis, is very short and inadequate and suggests a small experience of this class of deformity on the author's part. The section on apparatus for palsy of various nerve trunks contains some useful hints. A good deal of space is given to the treatment of scoliosis by active and passive exercises, but this chapter and the short ones on rickets, coxa vara and flat-foot, call for no remark.

From the foregoing it will be gathered that Dr. Privat takes a somewhat restricted view of orthopaedic practice. Although very occasionally he recommends cutting operations he does not describe any, and he ignores the orthopaedic treatment of injuries of bones and joints. Like so many Continental surgeons, he appears never to have heard of Thomas's knee and hip splints.

DUFF HOUSE PAPERS.

THE volume *Duff House Papers*[5] is a series of articles on diagnosis and treatment, written for the most part by members of the staff of Duff House and edited by Dr. E. I. SPRIGGS. They are selections from the papers issued from Duff House from its opening in September, 1913, to the present time. Some of the articles are reprints of contributions to medical journals, as, for instance, the article on "Meat Diet in Sprue" which appeared in the BRITISH MEDICAL JOURNAL, August 7th, 1920. The new matter in the book includes a manual for the use of diabetic patients, in which the nature of the disease is explained; every little detail of the measurement of food and examination of the urine is described, and the principles of treatment made clear,

[4] *L'Orthopédie en Clientèle.* By J. Privat. Paris: A. Maloine et Fils. 1923. (Cr. 8vo, pp. 817; 595 figures. Fr. 25.)

[5] *Duff House Papers.* Edited by E. I. Spriggs, M.D., F.R.C.P. Vol. I. Oxford Medical Publications. London: Henry Frowde, and Hodder and Stoughton. 1923. (Double cr. 8vo, pp. x + 387; 190 figures, 1 plate. 30s. net.)

so as to secure the patient's co-operation. This is supplemented by an article on diabetic cookery by the diet sister of Duff House, and an account by the gardener of the best means of securing a good supply of greens, salads, and other vegetables suitable for diabetics.

Other new matter in the present volume includes a detailed account of the *x*-ray technique employed at Duff House for examination of the alimentary canal. Seventy pages, profusely illustrated, describe the examination of each section of the intestinal passage, and interpret the appearances revealed by *x* rays in pathological conditions commonly encountered.

The wide field covered by the different papers should make the volume of interest to many members of the medical profession, and the service it is capable of rendering is certainly enhanced by the attractive way in which the book is printed and the excellent illustrations with which it is embellished.

PROTISTS AND DISEASE.

THE difficulty of deciding whether certain unicellular forms of life belong to the animal or vegetable kingdom led Haeckel to suggest that the name Protista should be given to these primitive creatures, and Mr. J. JACKSON CLARKE has adopted this classification in his book *Protists and Disease*.[6] He has previously published five books, four of which have appeared under the title of "Protozoa and Disease"; in these he has described the organisms he has observed in molluscum contagiosum, small-pox, syphilis, and cancer, and believes to be the cause of these diseases. The present book is a restatement of his case. The title has been altered because he has come to the conclusion that the organisms he describes are not protozoa but protists allied to Synchytriaceae; he has set out to establish the biological relationship of these organisms with well recognized species. The subject is introduced by a review of unicellular forms of life and a consideration of many different botanical forms which do not always appear under their more familiar names, and whose connexion with the main thesis of the book is not at first apparent. It is with greater interest that the reader arrives at an account of *Plasmomyxa contagiosa*, described as the pathogenic member of the Plasmomyxineae responsible for the disease molluscum contagiosum. Here the author describes vividly what he has seen and the way in which the parasite may be cultivated. He has found a similar parasite in sarcoma, the cause of which he considers to be a parasite that first invades the nuclei of connective tissue cells, escapes thence into the cytoplasm of the host cell, and thence again into the intercellular spaces. The parasite subdivides, "either with or without the formation of chromatin," into amoebulae which tend to assume a stellate form. Corresponding ideas are advanced with regard to small-pox, syphilis, and hydrophobia.

It is apparent that the author's views as to the causation of these diseases are not in accordance with those held by the majority of pathologists, and it is for this reason that we would commend the book to them rather than to other members of the medical profession. When Emerson said, "Truly speaking I can receive instruction from no man, but provocation," he indicated the benefit that can be derived from contact with ideas the opposite of our own. Still we must warn even this group of readers that the book has certain defects of construction, one of which is that the author has a way of not always sticking to the point.

NOTES ON BOOKS.

PUBLIC health nursing is a term "devised to describe more fittingly an infinite variety of functions" which are "the extension of an old service variously known as neighbourliness, sick visiting, and visiting nursing." So we are told in the introduction to a readable and useful work[7] containing an historical survey of the development and present position of professional nursing service, not merely in America, whence the book comes, but also in the old world. Public health nursing in the sense indicated does not imply the existence of sickness. It includes domestic education in the prevention of sickness, and so corresponds in the sphere of the nurses to preventive medicine in the sphere of the doctors. Obviously it embraces the work of health visitors in this country and visiteuses d'enfants in France. The author goes far back into history, discussing nursing in the Roman Empire and in the Middle Ages, tracing the beginnings of sanitary service; giving some account of the work of Florence Nightingale and the founding of district nursing under Rathbone in Liverpool, and the later specializations of nursing in war and peace. Emphasis is laid on the teachings of experience that nursing should not be combined with the distribution of doles, and that for material relief the needy should be referred to agencies established for the purpose. That principle was established in the early days in Liverpool, and was also learnt in America, as in Buffalo, where "no relief is now handled by the [Nursing] Association, but every nurse is taught to refer to the proper agency cases within her section requiring material aid." The services of the nurse are not confined to the needy, nor are they limited to the sick; "her work is pre-eminently constructive, and if her training as a nurse is essential her ability as a teacher is equally so." Miss BRAINARD'S book can be heartily recommended as well arranged and well written, and distinguished alike by knowledge and wisdom.

There has of recent years in this and other countries been a large development of organized physical exercises. Games will always have first place in the affections of youth, but there are occasions and places where games are insufficient for all those who need the physical stimulation and exercise which organized instruction can and should give. Where there are large bodies of children or young people some organization of physical exercises in which all should take a share is necessary, otherwise some (and often those who need this training the most) by reason of shyness, diffidence, or a feeling that theirs is not to strive and win at games, may be left without the very discipline they need. Major F. W. STEVENS, late of the Essex Regiment, has written a very useful and compact little handbook of such physical exercises.[8] He has striven to make as complete a series of exercises as can be carried out in a moderate-sized gymnasium, with a minimum of equipment, and of such general interest to the performers as will attract them to engage in this training of their own free will. The exercises are composed in such fashion that they can be performed to musical accompaniment, which adds much to the interest and enjoyment of the pupil, and naturally induces grace of movement. Besides the set forms of organized movements suggestions are included for a number of brisk games which may be played in the gymnasium during intervals, and in these full play can be given to the exuberant vitality of youth and the natural desire for freedom of movement. The book is well illustrated and conveniently arranged, so that it should form a handy guide to instructors and teachers generally.

The second edition of the second volume of Professor W. BIRK'S book on diseases of children,[9] dealing with conditions past the age of infancy, is, with the exception of a few minor alterations, substantially the same as the first, published some eighteen months ago. It has apparently proved itself a popular textbook for students and practitioners in Germany. Covering a wide field, it gives a very condensed account of symptomatology and treatment. Out of a total of about 340 pages some 120 are allotted to the acute infectious fevers, tuberculosis, and syphilis. The remaining subjects are crowded into a space that scarcely allows of adequate presentation. Those who prefer such a severe abridgement may find it a serviceable book.

The first volume of the *Minutes of the Dental Board of the United Kingdom and of its Various Committees*[10] has been issued. It covers the period from December 7th, 1921, when the first meeting of the Board was held, to December 31st, 1922. The Board consists of a chairman, the Right Hon. Francis Dyke Acland, M.P.; three persons, not registered medical practitioners or dentists, appointed by the Minister of Health, the Scottish Board of Health, and the Lord Lieutenant of Ireland, respectively; three persons appointed by the General Medical Council—namely, Mr. H. J. Waring, F.R.C.S., Sir James Hodsdon, K.B.E., F.R.C.S.Edin., a member of the Branch Council for Scotland, and Sir Arthur Chance, F.R.C.S.I., a member of the Branch Council for Ireland; and six persons engaged in the practice of dentistry—two appointed by the Privy Council, two by the Minister of Health, one by the Scottish Board of Health, and one by the

[6] *Protists and Disease.* By J. Jackson Clarke, M.B.Lond., F.R.C.S. London: Baillière, Tindall, and Cox. 1922. (Fcap. 4to, pp. xii+229; 1 plate, 61 figures. 15s. net.)

[7] *The Evolution of Public Health Nursing.* By Annie Brainard. Philadelphia and London: W. B. Saunders Co. 1922. (Cr. 8vo, pp. 451; illustrated. 15s. net.)

[8] *The New Era Handbook of Physical Exercises.* By Major F. W. Stevens. London: Stevens's Exercise Equipment Service. 1923. (Roy. 16mo, pp. 49; 102 figures. 2s. 6d. net.)

[9] *Leitfaden der Kinderheilkunde.* Von Dr. Walter Birk, o. ö. Prof. d. Kinderheilkunde a. d. Universität Tübingen. Zweiter Teil: Kinderkrankheiten. Zweite, verbesserte Auflage. Bonn: A. Marcus und E. Weber. 1922. (Demy 8vo, pp. 315; 11 figures.)

[10] Published and sold for the Dental Board by Constable and Co., Ltd. 1923.

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DR. PRIVAT'S book on orthopaedics in general practice[4] forms one of the Series Comment Guérir (How to Cure), and its avowed aim is to enable the general practitioner to make early diagnosis, give an accurate prognosis to the friends, and carry out the treatment to as successful a conclusion as is possible. Therefore the author has restricted himself to the usual run of orthopaedic cases, and has not attempted to discuss rarities or disputed points in pathology or treatment. Assuming that his readers have no special knowledge, Dr. Privat rightly goes minutely into every small detail of the technique which must be followed in the application of plaster-of-Paris and other supports and corrective apparatus.

Beginning by laying stress on the importance of immobilization in the treatment of surgical tuberculosis and some other conditions, the author defines contractions of joints, and describes ingenious and simple methods by which the patient can carry out passive movements. The next two hundred pages are taken up by directions for the application and the care of plaster-of-Paris appliances. The advice given is practical and based upon good principles. We think, however, that the excellent shears of Stille for the removal of plaster should have been mentioned as a labour-saving instrument of great value.

In another 270 pages the treatment of surgical tuberculosis and some other infections is dealt with on conservative orthopaedic lines, with which open-air hospitals have made us familiar in this country as well as abroad. For injection of abscesses after aspiration Dr. Privat uses a mixture of olive oil, ether, creosote, guaiacol, and iodoform, but he does not attach very great importance to the composition of this fluid. In cases of inspissation of pus in chronic abscess he recommends a liquefying injection. Methods of correcting ankylosis in bad functional position are recommended and described.

The third part of the book treats of congenital affections, such as wry-neck, dislocation of hip, and club-foot. The fourth part, on infantile paralysis, is very short and inadequate and suggests a small experience of this class of deformity on the author's part. The section on apparatus for palsy of various nerve trunks contains some useful hints. A good deal of space is given to the treatment of scoliosis by active and passive exercises, but this chapter and the short ones on rickets, coxa vara and flat-foot, call for no remark.

From the foregoing it will be gathered that Dr. Privat takes a somewhat restricted view of orthopaedic practice. Although very occasionally he recommends cutting operations he does not describe any, and he ignores the orthopaedic treatment of injuries of bones and joints. Like so many Continental surgeons, he appears never to have heard of Thomas's knee and hip splints.

DUFF HOUSE PAPERS.

THE volume *Duff House Papers*[5] is a series of articles on diagnosis and treatment, written for the most part by members of the staff of Duff House and edited by Dr. E. I. SPRIGGS. They are selections from the papers issued from Duff House from its opening in September, 1913, to the present time. Some of the articles are reprints of contributions to medical journals, as, for instance, the article on "Meat Diet in Sprue" which appeared in the BRITISH MEDICAL JOURNAL, August 7th, 1920. The new matter in the book includes a manual for the use of diabetic patients, in which the nature of the disease is explained; every little detail of the measurement of food and examination of the urine is described, and the principles of treatment made clear,

[4] *L'Orthopédie en Clientèle.* By J. Privat. Paris: A. Maloine et Fils. 1923. (Cr. 8vo, pp. 817; 595 figures. Fr. 25.)

[5] *Duff House Papers.* Edited by E. I. Spriggs, M.D., F.R.C.P. Vol. I. Oxford Medical Publications. London: Henry Frowde, and Hodder and Stoughton. 1923. (Double cr. 8vo, pp. x + 387; 190 figures, 1 plate. 30s. net.)

so as to secure the patient's co-operation. This is supplemented by an article on diabetic cookery by the diet sister of Duff House, and an account by the gardener of the best means of securing a good supply of greens, salads, and other vegetables suitable for diabetics.

Other new matter in the present volume includes a detailed account of the *x*-ray technique employed at Duff House for examination of the alimentary canal. Seventy pages, profusely illustrated, describe the examination of each section of the intestinal passage, and interpret the appearances revealed by *x* rays in pathological conditions commonly encountered.

The wide field covered by the different papers should make the volume of interest to many members of the medical profession, and the service it is capable of rendering is certainly enhanced by the attractive way in which the book is printed and the excellent illustrations with which it is embellished.

PROTISTS AND DISEASE.

THE difficulty of deciding whether certain unicellular forms of life belong to the animal or vegetable kingdom led Haeckel to suggest that the name Protista should be given to these primitive creatures, and Mr. J. JACKSON CLARKE has adopted this classification in his book *Protists and Disease*.[6] He has previously published five books, four of which have appeared under the title of "Protozoa and Disease"; in these he has described the organisms he has observed in molluscum contagiosum, small-pox, syphilis, and cancer, and believes to be the cause of these diseases. The present book is a restatement of his case. The title has been altered because he has come to the conclusion that the organisms he describes are not protozoa but protists allied to Synchytriaceae; he has set out to establish the biological relationship of these organisms with well recognized species. The subject is introduced by a review of unicellular forms of life and a consideration of many different botanical forms which do not always appear under their more familiar names, and whose connexion with the main thesis of the book is not at first apparent. It is with greater interest that the reader arrives at an account of *Plasmomyxa contagiosa*, described as the pathogenic member of the Plasmomyxineae responsible for the disease molluscum contagiosum. Here the author describes vividly what he has seen and the way in which the parasite may be cultivated. He has found a similar parasite in sarcoma, the cause of which he considers to be a parasite that first invades the nuclei of connective tissue cells, escapes thence into the cytoplasm of the host cell, and thence again into the intercellular spaces. The parasite subdivides, "either with or without the formation of chromatin," into amoebulae which tend to assume a stellate form. Corresponding ideas are advanced with regard to small-pox, syphilis, and hydrophobia.

It is apparent that the author's views as to the causation of these diseases are not in accordance with those held by the majority of pathologists, and it is for this reason that we would commend the book to them rather than to other members of the medical profession. When Emerson said, "Truly speaking I can receive instruction from no man, but provocation," he indicated the benefit that can be derived from contact with ideas the opposite of our own. Still we must warn even this group of readers that the book has certain defects of construction, one of which is that the author has a way of not always sticking to the point.

NOTES ON BOOKS.

PUBLIC health nursing is a term "devised to describe more fittingly an infinite variety of functions" which are "the extension of an old service variously known as neighbourliness, sick visiting, and visiting nursing." So we are told in the introduction to a readable and useful work[7] containing an historical survey of the development and present position of professional nursing service, not merely in America, whence the book comes, but also in the old world. Public health nursing in the sense indicated does not imply the existence of sickness. It includes domestic education in the prevention of sickness, and so corresponds in the sphere of the nurses to preventive medicine in the sphere of the doctors. Obviously it embraces the work of health visitors in this country and visiteuses d'enfants in France. The author goes far back into history, discussing nursing in the Roman Empire and in the Middle Ages, tracing the beginnings of sanitary service; giving some account of the work of Florence Nightingale and the founding of district nursing under Rathbone in Liverpool, and the later specializations of nursing in war and peace. Emphasis is laid on the teachings of experience that nursing should not be combined with the distribution of doles, and that for material relief the needy should be referred to agencies established for the purpose. That principle was established in the early days in Liverpool, and was also learnt in America, as in Buffalo, where "no relief is now handled by the [Nursing] Association, but every nurse is taught to refer to the proper agency cases within her section requiring material aid." The services of the nurse are not confined to the needy, nor are they limited to the sick; "her work is pre-eminently constructive, and if her training as a nurse is essential her ability as a teacher is equally so." Miss BRAINARD'S book can be heartily recommended as well arranged and well written, and distinguished alike by knowledge and wisdom.

There has of recent years in this and other countries been a large development of organized physical exercises. Games will always have first place in the affections of youth, but there are occasions and places where games are insufficient for all those who need the physical stimulation and exercise which organized instruction can and should give. Where there are large bodies of children or young people some organization of physical exercises in which all should take a share is necessary, otherwise some (and often those who need this training the most) by reason of shyness, diffidence, or a feeling that theirs is not to strive and win at games, may be left without the very discipline they need. Major F. W. STEVENS, late of the Essex Regiment, has written a very useful and compact little handbook of such physical exercises.[8] He has striven to make as complete a series of exercises as can be carried out in a moderate-sized gymnasium, with a minimum of equipment, and of such general interest to the performers as will attract them to engage in this training of their own free will. The exercises are composed in such fashion that they can be performed to musical accompaniment, which adds much to the interest and enjoyment of the pupil, and naturally induces grace of movement. Besides the set forms of organized movements suggestions are included for a number of brisk games which may be played in the gymnasium during intervals, and in these full play can be given to the exuberant vitality of youth and the natural desire for freedom of movement. The book is well illustrated and conveniently arranged, so that it should form a handy guide to instructors and teachers generally.

The second edition of the second volume of Professor W. BIRK'S book on diseases of children,[9] dealing with conditions past the age of infancy, is, with the exception of a few minor alterations, substantially the same as the first, published some eighteen months ago. It has apparently proved itself a popular textbook for students and practitioners in Germany. Covering a wide field, it gives a very condensed account of symptomatology and treatment. Out of a total of about 340 pages some 120 are allotted to the acute infectious fevers, tuberculosis, and syphilis. The remaining subjects are crowded into a space that scarcely allows of adequate presentation. Those who prefer such a severe abridgement may find it a serviceable book.

The first volume of the *Minutes of the Dental Board of the United Kingdom and of its Various Committees*[10] has been issued. It covers the period from December 7th, 1921, when the first meeting of the Board was held, to December 31st, 1922. The Board consists of a chairman, the Right Hon. Francis Dyke Acland, M.P.; three persons, not registered medical practitioners or dentists, appointed by the Minister of Health, the Scottish Board of Health, and the Lord Lieutenant of Ireland, respectively; three persons appointed by the General Medical Council—namely, Mr. H. J. Waring, F.R.C.S., Sir James Hodsdon, K.B.E., F.R.C.S.Edin., a member of the Branch Council for Scotland, and Sir Arthur Chance, F.R.C.S.I., a member of the Branch Council for Ireland; and six persons engaged in the practice of dentistry—two appointed by the Privy Council, two by the Minister of Health, one by the Scottish Board of Health, and one by the

[6] *Protists and Disease*. By J. Jackson Clarke, M.B.Lond., F.R.C.S. London: Baillière, Tindall, and Cox. 1922. (Fcap. 4to, pp. xii+229; 1 plate, 61 figures. 15s. net.)

[7] *The Evolution of Public Health Nursing*. By Annie Brainard. Philadelphia and London: W. B. Saunders Co. 1922. (Cr. 8vo, pp. 451; illustrated. 15s. net.)

[8] *The New Era Handbook of Physical Exercises*. By Major F. W. Stevens. London: Stevens's Exercise Equipment Service. 1923. (Roy. 16mo, pp. 49; 102 figures. 2s. 6d. net.)

[9] *Leitfaden der Kinderheilkunde*. Von Dr. Walter Birk, o. ö. Prof. d. Kinderheilkunde a. d. Universität Tübingen. Zweiter Teil: Kinderkrankheiten. Zweite, verbesserte Auflage. Bonn: A. Marcus und E. Weber. 1922. (Demy 8vo, pp. 345; 11 figures.)

[10] Published and sold for the Dental Board by Constable and Co., Ltd. 1923.

Lord-Lieutenant of Ireland. The volume also contains six appendices, including the standing orders of the Board, reports of the Examination Committee, and the warning notice as approved by the General Medical Council on November 30th, 1922.

THE PREPARATION OF PATIENTS FOR OPERATION.

WE have received from Dr. T. M. Allison of Newcastle-on-Tyne a letter in which he condemns the administration to patients before operation of purgatives and enemas, a method which he implies is followed in some hospitals and nursing homes as a matter of routine. He writes:

The surgery of the present day, which I greatly admire, has two great and glorious achievements to its credit—anaesthesia and asepsis. But it has still certain reproaches, one of which is the "preparation" of patients for operation.

How many of the patients who die on the operating table die, not from the operation, nor from the anaesthetic, but from the "preparation"? A nervous patient, afraid of the unknown (and most of us are afraid), is given a barbaric dose of unnecessary aperient the night before the operation, is kept awake the most of the night, and rendered unfit for the morrow by sleeplessness, griping pain, and getting out of bed. Instead, therefore, of refreshing sleep, the patient is worried physically and mentally most of the night, and the last chance of repose is banished by an enema in the early morning. Anything less scientific can hardly be imagined, as the patient goes on to the table "prepared" rather for collapse than for operation. If this surgical fetish is in any way desirable, might I suggest that it be done two or three days before the operation? Before the operation, in my opinion, it would be wiser and kinder to give 2½ grains (each) of veronal and phenacetin, with half a grain of caffeine at 7 o'clock the previous evening, and/or a grain of opium at 9 p.m.; personally I would rather have both than the castor oil and the enema.

Happy, indeed, is the emergency case, even with a ruptured gastric or duodenal ulcer (in whom no "preparation" is possible) in comparison with the "prepared patient," and it would be both interesting and instructive if some of our hospital surgeons would give their impressions and statistics on these two classes of cases.

The matter is one of considerable importance, and it has seemed worth while to gather together the opinions some surgeons have expressed upon it.

The suggestion that purging before an operation is harmful rather than beneficial to the patient is not, indeed, new. So long ago as 1861 Oliver Wendell Holmes said[1]: "If it were known that a prize-fighter were to have a drastic purgative administered two or three days before a contest . . . no one will question that it would affect the betting on his side unfavourably." The custom of purging has, however, a long history to support it, dating back beyond humoral pathology to the dawn of civilization. Purgatives were given to healthy persons about to undergo any ordeal—those starting on a journey were purged; those about to be bled; those about to be tortured for the extortion of confessions.[2] As early as 1776 Cullen[3] questioned the value of "these pretended preparatory courses of medicine. . . . Other mischievous effects have sometimes appeared."

It would appear that some teachers of surgery continue to recommend the employment of the purge and the enema before operation, and that the practice is a routine in many hospitals and nursing homes. J. P. Warbasse,[4] for example, in 1918, says: "The day before operation a laxative should be given. . . . On the morning of the operation it is well to give an enema." A. Carless,[5] in 1920, says: "During the previous day an effective purgative is given, and an enema may be desirable in the morning." G. E. Gask,[6] in 1920, says: "The bowel should be well cleared out by a dose of castor oil followed by an enema early in the morning of the day of operation." On the other hand, a review of recent literature shows that there is a decided tendency among many surgeons to discontinue pre-operative purgation or to diminish its severity.

E. Walker[7] reported that he had not used purgation as a preparation for operation for more than two years, and that he was convinced that his patients suffered less with tympany and recovered more quickly. J. E. Moore[8] reported favourable results from the disuse of pre-operative catharsis. Yelverton Pearson[9] said that he did not give purges later than the morning of the day previous to operation, and that no enema was permitted as a preliminary to operation. Kocher's opinion[10] was that no patient should come to operation with a full bladder or rectum. On the morning of the operation a warm soap-and-water enema should be administered. The intestinal canal must be emptied, but the action of the purge should have ceased by the day of the operation; two days before the operation the patient was given one to two tablespoonfuls of castor oil or a dessertspoonful of natural Karlsbad salts. G. W. Crile[11] warns against starving a patient too long and purging too severely before operation, because it interfered with the normal tone of the intestine. W. J. Mayo[12] has pointed out that the difficulties and dangers of using clamps in gastro-intestinal operations are increased by purgation. W. C. Alvarez,[13] who gives a good summary of the literature on the subject, is of the opinion that the purgation of patients before operation is not justifiable. He says that experienced nurses have told him that they preferred looking after an emergency to a prepared abdominal case, and that most surgeons whom he consulted on the subject stated that they gave up the routine purge at the suggestion of their nurses. They all agreed that the stormiest after-courses and the worst "gas pains" were met with in the elaborately prepared cases. His experimental work on the intestine confirmed him in his opinion.[14] Purgation caused hyperaemia of the entire intestinal mucosa; the majority of purged animals showed increased intestinal gas and often congestion of the mesenteric circulation; purgation made the bowel react very poorly to drugs, the doses sometimes requiring to be increased one hundred times to produce any effect. L. A. Enge[15] reviews the work of others on this subject, and concludes from his own clinical observations on a series of cases that the strongly purged bowel is more difficult to handle than the unpurged bowel on account of congestion and distension, and that patients who have not been purged are comparatively free from "gas pains." He believes that an enema will clear the lower bowel sufficiently for any operation. It is interesting to compare two successive editions of *Pye's Surgical Handicraft*, edited by W. H. Clayton-Greene. In the seventh edition (1916) the following words are found: "It is better in most cases to purge the patient two days before the operation and to administer the enema the evening before." In the eighth edition (1919), however, we find the following: "It is not necessary to starve or purge our patients in the drastic manner customary some years ago. An aperient such as a patient has been used to, or a small dose of castor oil, should be given forty-eight hours before. Except in rectal cases the enema may be omitted." E. Wyllys Andrews[16] is strongly of opinion that a simple enema the night before is ample preparation for most surgical procedures.

Sir Berkeley Moynihan[17] says: "Flatulence is a troublesome complication, not only of abdominal, but of other operations also. Its cause is uncertain. My own view is that it chiefly results from the starvation and purgation which are almost universally considered a necessary part of the ritual of deliberate operations. Both are certainly undesirable and are possibly harmful. . . . An enema generally clears the colon quite as much as is necessary." Sir William de Courcy Wheeler said recently,[18] regarding his own practice, that no laxatives to cause purging were ever given to patients before operation, and no enema was given on the morning of operation.

The literature of surgery is not so full as it might be upon this particular point. The pre-operative treatment of patients—and particularly the giving or withholding of purgatives—is frequently skimmed over in textbooks on surgery and operative surgery, and when it is mentioned at all the subject is usually buried in articles pertaining to other subjects. J. F. Binnie,[19] for example, states that, following Wetherill, he has discarded post-operation catharsis; but he does not say (so far as could be ascertained) whether or not he advises purgatives before operation. For a long time it has been recognized as an axiom in surgery, following the teaching of Moynihan, that an aperient should never be administered to a patient with a suspicious acute abdominal lesion. The consensus of surgical opinion to-day is apparently towards extending this by discontinuing the giving of purgatives before operative procedures of whatever nature.

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British Medical Journal.

SATURDAY, MARCH 17TH, 1923.

THE RIGHTS OF A REGISTERED MEDICAL PRACTITIONER.

WE desire to draw the attention of the medical profession of this country to an insidious attack now being made by a Government department upon its legal rights. The whole subject is receiving the close attention of the British Medical Association and of the medical members of Parliament acting in concert, and (as will be seen from the Current Note published in this week's SUPPLEMENT) steps are being taken to defend the threatened liberties. Our purpose here is to dwell upon certain matters of principle in order that the profession may understand the larger issues that are at stake.

Section 31 of the Medical Act, 1858, on "privileges of registered persons," laid down that every person registered under the Act should be entitled, according to his qualification or qualifications, to practise medicine or surgery, or medicine and surgery, as the case might be, in any part of Her Majesty's dominions. The Medical Act, 1886, declared, by Section 6, that a registered medical practitioner was entitled to practise medicine, surgery, and midwifery in the United Kingdom, and (subject to any local law) in any part of Her Majesty's dominions. The effect of these Acts was to set up one class of legally qualified practitioner of medicine and to give him one name—"registered medical practitioner." From that time to this every registered medical practitioner has had in the eyes of the law an equal standing with every other registered medical practitioner.

Registration, while it imposes certain legal obligations, confers also certain privileges which are common to every person registered under the Medical Acts. A legally qualified medical practitioner may choose to practise his profession, or may not so choose; he may be one day in practice and another day not in practice; that is his own concern. So long as his name appears on the *Medical Register* he is a registered medical practitioner, with all the rights and responsibilities that that term connotes. The law does not ask whether a doctor is in practice; it asks if he is registered. Acts of Parliament have not hitherto distinguished between practitioners in active practice and retired practitioners; nor have they attempted to define the term "medical practice." In this the Legislature has shown wisdom and common sense. One doctor may practise all the year round, and another (who has taken, say, to rose growing) may practise once in six months by prescribing a dose of calomel or opium for his head gardener. The point is that every registered practitioner is potentially in practice. A grocer cannot carry on his trade without a shop, but a doctor can exercise his profession without a brass plate; he takes his professional knowledge with him into retirement, and no one can say when he may find occasion to employ it. In national or local emergencies there is no such person as a "retired" doctor.

But the Home Office, it appears, has other views. Not content with making different rules for insurance practitioners and for practitioners-not-on-the-panel in regard to the signing of prescriptions for a particular group of "dangerous drugs," the Home Office now proposes to discriminate, by words included in an Act of Parliament, between registered medical practitioners in actual practice and registered medical practitioners not in actual practice. For proof that this is so we refer our readers to Section 3 of the Dangerous Drugs and Poisons (Amendment) Bill, introduced recently into the House of Commons by the Home Secretary. (See SUPPLEMENT, February 24th, 1923.) With the motive for this innovation we are not at the moment concerned; nor with its obvious futility. What we wish to point out is that the Home Office is endeavouring for its own purposes to bisect the body of registered medical practitioners of this country.

This, however, is not the only infringement of the rights and liberties of the registered medical practitioner. Last summer the Home Office informed the British Medical Association that it was proposing to amend the regulations under the Dangerous Drugs Act, 1920, so as to forbid the dispensing of a prescription for "the drugs" written by a medical practitioner for his own use. The Medico-Political Committee recognized at once that this proposal was both futile and vexatious, and so reported to the Council of the Association. The Council informed the Home Office that the proposed new regulation was an undesirable limitation of the privileges of a registered medical practitioner without any compensating advantage to the public. But the Home Office, unmoved by argument, proceeded upon its course, and tacked on to Regulation 5 the words, "The prescription shall not be given for the use of the prescriber himself." In the debate on the amending bill in the House of Commons on February 28th the inconvenience and the absurdity of this prohibition was pointed out in cogent terms by two medical members—Dr. L. G. S. Molloy and Sir Sydney Russell-Wells. To our mind it is of importance because it raises a matter of principle. We perceive in this, as in the use of the words "in actual practice," the thin end of a wedge.

THE SCHOOL OF HYGIENE.

IT was recently stated in a London newspaper that, owing to a further act of generosity on the part of the Rockefeller trustees, the appointment of a director of the projected School of Hygiene would be able to be made before the school has a bodily existence. This means, we presume, that the director will have ample opportunities of conferring with his future colleagues, the professors designate—the designation of the professors should speedily follow the appointment of a director—on the spiritual future of the institution.

It is perfectly consonant with the psychology of the English race that the actual level of knowledge of preventive medicine and hygiene* should be higher than its academic status, that the practical value of the instruction given should be greater than the apparatus of teaching would imply. In only a minority of English universities can the doctorate be attained by proficiency in the subject; in some, ignorance of the principia of preventive medicine does not form a barrier to graduation. Just as in the sister profession of Law the merely formal requirements of the Inns of Court, sixty years ago, led to no great scandal because those who intended to practise took pains to learn their work in the chambers of adepts, so the aspiring specialist in public health has had to take pains to learn his business without academic stimulation.

But one evil of the old system in the Inns of Court was, as that shrewd observer Walter Bagehot noticed, the discouragement of the philosophical jurist and the encouragement of the acute but mentally limited case-lawyer. Something of the same kind has happened in our profession. In the training of the younger men all the emphasis has been on technical acquirement. It would not be going too far to say that most young candidates for posts in the public health

* The connotations of the words are not identical: both might be covered by conservative medicine, an expression Farr wished to introduce fifty years ago.

service are far better acquainted with the inside of a bacteriological laboratory and with the provisions of the Public Health Acts than with the principles of epidemiology. We doubt whether ten per cent. of the successful candidates in any D.P.H. examination could accurately describe the steps leading up to any of the classical inductions of Simon, Ballard, Farr, or Thorne Thorne, though they are no doubt acquainted with the results, which are summarized in every textbook.

A broadening of outlook is the function of a university education. Without it a diffusion of interests easily degenerates into slovenly omniscience. We had far rather see our public health services officered by the narrowest of technicians than by bookish philosophers, but there is no need to run from one extreme to the other. It will be the duty of the new School of Hygiene to raise the general level of culture: directly, by offering a well balanced course of instruction to its post-graduate students; indirectly, by setting before the profession a higher intellectual ideal than the existing system of public health training can in itself afford.

These ends can only be compassed by close and loyal co-operation between the members of the staff of the new institution. We mean by this much more than the ordinary good feeling which informs the relations within any group of gentlemen. It is so easy for any man to beguile himself into thinking that he must be right in demanding more and more time for his branch of knowledge, and that to acquiesce in a time table which allots fewer hours to his subject than to someone else's subject is disloyal to the interests committed to his charge. Because of this tendency, we think the appointment of a director and staff well in advance of the opening of the school is a statesmanlike act. A new professor in an old university, however enthusiastic, has few temptations to attack at once the existing order. In a new institution the case is different. It is unthinkable that any men of science would accept a programme imposed upon them by an external authority, equally incredible that they should arrive at a concordat without much discussion. This discussion, aided, we should hope, by a ventilation of the subject throughout the whole profession, ought to begin in the very near future.

THE OCTOCENTENARY OF ST. BARTHOLOMEW'S.

EIGHT hundred years ago this spring two buildings were being erected on a playground just outside the walls of the City of London, which was then called Noman's Land, though it has long been known as Smithfield. Both buildings, in accordance with the faith of the times, were intended to be religious foundations—the one for the good of the soul, the other of the body; the one a Convent of Augustinian Canons, the other a Hospital where the sick poor could be tended until they recovered, and women with child until they had been delivered. The zeal and piety of Rahere raised them simultaneously. In early life a member of the Court of Henry Beauclerc, but saddened perhaps by some loss in the wreck of the White Ship, he had turned his thoughts to religion. Becoming himself the first Prior of the new Convent, he arranged that the two foundations should be independent yet associated, and so long as he lived they worked in harmony. The canons recommended patients to the hospital and gave a tithe of their bread with the leavings of their meat, fish, and drink to feed them; the hospital, when supplies abounded, gave to the canons anything of which they lacked. The Prior of the Convent and the Master of the Hospital were independent of each other, though both were chosen by the convent. When a new sister was admitted at the hospital she was chosen by the prior upon the recommendation of the master and brethren of the hospital. She swore fidelity to the prior and the convent, but obedience to the master of the hospital. Twice in a year, on Palm Sunday and Ascension Day, the master and brethren of the hospital went in solemn procession to the convent church and there made their offerings and oblations. Finally, they and their patients had the right of being buried in the priory cemetery. Such an interrelation did not last long. Canons who preached charity sermons for the hospital sometimes applied the proceeds to the uses of the convent; whilst the hospital chaplains when they begged in the name of the priory occasionally distributed the contents of their bowls amongst the patients in the hospital. Hence arose dissensions, made more acute by permission from Pope Calixtus for the hospital to have a cemetery of its own. Such permission nowadays would hardly seem a reasonable *casus belli*, but at that time many wealthy citizens, in token of humility, chose to be buried amongst the poor, and a private burial ground was a source of considerable income. The squabbles continued for many years, and repeated appeals were made to Rome, until, in 1373, the convent and the hospital were virtually separated from each other by the arbitration of Simon of Sudbury, Bishop of London. The separation preserved the hospital. More than a hundred and fifty years later, when the priory was suppressed and its revenues were confiscated, the endowments of the hospital, after passing into the hands of King Henry VIII, were partly returned at the urgent solicitation of the Mayor and Corporation of the City of London. The independence of the two foundations remained even after the Reformation. The convent and its precincts became the parish of St. Bartholomew-the-Great, with a portion of the old priory church as the parish church; the hospital became the parish of St. Bartholomew-the-Less, with its principal chapel, dedicated to the Exaltation of the Holy Cross, as the parish church. All trace of the conventual buildings gradually became lost, and the church was allowed to fall into decay, whilst the hospital continued its beneficent work as a secular institution. It is somewhat remarkable, so persistent is custom in this country, that the hospital still celebrates the anniversary of its foundation, though in a debased form, by the annual "View Day," while the church has no such memorial. After the Reformation the governors of the hospital were summoned to meet at seven o'clock on a March morning for the purpose of attending divine service in the church, and afterwards to view the hospital. In these more degenerate days the viewing of the hospital is done at half-past two in the afternoon of the first Wednesday in May. The earlier hour in the earlier month was doubtless a survival of the pre-Reformation service, like that which is still held on May Day morning at Magdalen College, Oxford. At any rate, it is quite in accordance with what little is known of Rahere's humour that he should choose for the dedication a day when the Mass begins with the Introit, "Laetare, Jerusalem, et facite Conventum." The Rector and Churchwardens commenced the Octocentenary celebrations at St. Bartholomew's-the-Great on mid-Lent Sunday (March 11th) with an appropriate service, which was largely attended, both in the morning and in the evening. Similar services will be held next Sunday. For many years the separation between the two bodies was complete, but for a short time when Sir William Savory was Surgeon to the Hospital his only son, Boradaile, was Rector of St. Bartholomew's-the-Great. From this time onwards there has always been a friendly interchange, and when the church lacked anything in the matter of funds the hospital by its medical and surgical staff have assisted in supplying the want. The hospital proposes to celebrate its own octocentenary at the beginning of June, and without any cost to itself, for the City in its corporate capacity and the Governors have always been proud of their great charity.

THE CONTROL OF BLOOD SUGAR.

A SERIES of communications of considerable interest regarding the mode of action of insulin are appearing by L. B. Winter and W. Smith, who are working in the Biochemical Laboratories at Cambridge. In a paper published in our columns on January 6th (p. 12) they related the results of experiments which showed that the sugar present in normal blood was

not the stable α, β form of glucose but was an unstable form of glucose, and probably γ glucose. They found, however, that the sugar in the blood of diabetics was probably the α, β form of glucose. They suggested that the tissues could only utilize γ glucose, and that an enzyme exists normally which changes the α, β form of glucose to γ glucose, and that diabetes was due to the absence of this enzyme. In a second communication[1] they showed that extracts of pancreas and liver could change the rotatory powers of glucose *in vitro*, and that this change was accelerated by the addition of phosphates. Work by Embden and Laquer has shown that a sugar-phosphoric complex is probably an intermediate stage in the utilization of glycogen by muscle. These conclusions suggest, of course, that the action of the pancreatic hormone, insulin, is to enable the change from α, β glucose to γ glucose to occur, and that one stage in this change is the formation of a sugar-phosphoric complex. In their last communication[2] Winter and Smith have published a very surprising conclusion, which may prove to be still more important. An essential stage in the metabolism of sugar by yeast is believed to be the formation of a sugar-phosphoric complex, and this suggested the idea that an extract of yeast might take the place of pancreatic extract. They obtained a solid extract of yeast which on injection lowered the blood sugar of rabbits and caused convulsions in rats. The suggestion is, of course, that yeast extract may be found to have an action similar to that of insulin. Though this may prove to be of profound importance, it must be clearly understood that at the present stage it must be regarded as an interesting suggestion rather than an established conclusion. Yeast extracts contain a number of substances with powerful pharmacological actions, and numerous substances—for example, peptones—can lower blood sugar, and many substances also can cause convulsions in rats. Until we have information as to the action of the yeast extract in diabetes it is impossible to form any conclusions as to the significance of the results here mentioned.

RHYTHM IN LIVING ORGANISMS.

SIR ARTHUR SHIPLEY, F.R.S., Master of Christ's College Cambridge, lectured to the Royal Institution on March 6th on rhythm in living organisms, especially that kind of rhythm which appeared to be inherent in the organisms and not dependent altogether on diurnal or seasonal change. He instanced the organisms which make the sea appear to be phosphorescent at night. It is not the case, as might be supposed, that these organisms merely need the darkness in order to exhibit their phosphorescence. If they are taken to a photographer's dark room they will still show phosphorescence, not in the day-time, but only after nightfall. The small worms of the genus Convoluta bury themselves in the sand when the tide rises and reappear on the surface with the ebb, but they still show this same action at the time of the tides when taken far from the seashore and placed in an aquarium. Another example is the seasonal growth of trees, evidenced by the annual rings; but if a deciduous tree be transplanted to the tropics, with virtual uniformity of temperature all the year round, the rhythm of seasonal growth will persist, at all events for a time. There is a rhythm in the bloom of flowers in the densest tropical forest, and a rhythm in the reproductive cycles of deep-sea organisms, although in the depth of the sea the influences of climate, temperature, season, light, and sound are withdrawn, and, with complete uniformity of external conditions, the secret of the rhythm must be within the organisms themselves. Rhythm in some living organisms appears to depend on the moon. A sea urchin in the Red Sea shows a definitely rhythmic growth and declension with the moon's phases, though similar sea urchins in the Mediterranean show no such rhythm. Some flowering plants are said to direct their stems towards the moon and follow its course at night. Sir Arthur Shipley pointed to the other instances of rhythm seen in spiral movements of the growing tendrils of plants, the action of muscles and organs, including the excretory organs, and the life of communities, alike of insects and of the civilizations of mankind.

[1] Winter and Smith: Proc. Physiol. Soc., December 16th, 1922.
[2] Winter and Smith: *Nature*, vol. 111, p. 327, March 10th, 1923.

CHANGES IN LIVING CELLS DURING GROWTH AND DIVISION.

DR. T. S. P. STRANGEWAYS, who has given prolonged study to the remarkable changes which take place in living cells during growth and division *in vitro*, has recently published in the *Proceedings of the Royal Society*[1] an account of what he has observed in cultures from the choroidal cells of chick embryos and the cartilage cells from knee-joints of adult fowls. By cultivating fragments of tissue in a drop of chick plasma, to which embryo chick extract has been added, and keeping the microscope and cultures at a temperature of 39° C., he was able to make a series of continuous observations, and the seventy-eight drawings he has produced illustrate the changes seen in a living cell from one division to another. The outline of a growing cell is constantly changing; larger or smaller processes of cytoplasm are thrown out and withdrawn as in amoeboid movement; the cells tend to assume an elongated shape, and by these activities may slowly change their position. Rod-like structures, described as mitochondria, may be seen in the cytoplasm moving from one place to another, and minute refractile granules move past and round the nucleus, but never enter this structure. The clearly defined nucleus may be round or oval and it wanders about the cell freely, being sometimes at the centre, at other times at one or other pole, its position depending largely on the movements of the cytoplasm. When large cytoplasmic processes are thrown out the nucleus may pass out with these processes and be drawn back if they retire. When first formed the nucleus is relatively small, but it soon increases in size and usually contains one or more irregularly shaped structures which stain intensely with iron haematoxylin; they are referred to provisionally as nucleoli. Brown pigment rods may also be seen moving about rapidly and irresponsibly in the cytoplasm. When about to divide the processes of cytoplasm retract and the cell assumes an oval or rounded shape; the nucleoli become fainter and appear as hazy granules. A number of fine threads may be seen in active writhing movement within the nucleus; the outline of the nucleus disappears and the chromosomes rapidly arrange themselves at right angles to the spindle, which with the centrosomes is visible at this stage. A few minutes later the chromosomes begin to draw apart from the centrosomes and show clearly as finger-like processes, being drawn towards either pole of the cell, which has by this time taken an oval shape. At this stage Dr. Strangeways describes a most interesting development in the outline of the cell. "Small balloons of cytoplasm project from the surface of the cell, remain for a few seconds and then collapse. The granules in the cytoplasm can be seen flowing in when the balloons are formed and streaming out when they collapse. This movement continues for about six minutes, new balloons being formed as the others collapse. This balloon formation is unlike amoeboid movement, and appears due to local changes of surface tension." The cells divide during this stage, and the two masses of cytoplasm pull apart, being joined only by fine filaments of cytoplasm and a few mitotic threads. The granules in the cytoplasm do not appear to take any active part in mitosis, but are in a state of active movement, flowing from one side or other of the two cytoplasmic masses, and they are ultimately distributed in fairly even numbers between the two newly formed cells. The time from the beginning of one division to the beginning of the next is between eleven and twelve hours, and the actual period occupied for complete division of a cell is on the average about thirty-four minutes. The constant activity of the living cell is clearly shown by these observations, for the cell and the structures within it are never at rest during growth and division.

[1] *Proc. Roy. Soc.*, B, vol. 94, 1922.

TREATMENT OF MENTAL DISORDERS.

BRIEF reference has already been made to Professor G. M. Robertson's annual report on the work at the Royal Hospital at Morningside; but as is his custom, he does not confine himself to a mere record of administrative and statistical details, and we may now mention some of the comments and observations he makes, which are of general public interest in connexion with the work of his hospital, which is a centre of active psychiatric work and is extending its sphere of usefulness in various directions. It is proposed to increase the accommodation and standard of treatment for private patients paying the lower rates of board. Not only will the patients and their relatives benefit by these proposals, but so will the community at large, as any measure which tends to prevent a patient from becoming a burden on the rates is of direct advantage to the public. Four homes for nervous cases have been established by the managers where the family physician can treat his patients under the supervision of an experienced staff till they recover, without the necessity of certification or asylum treatment. Scotland is fortunately situated, as Professor Robertson observes, in having a law which enables this form of early treatment to be conducted in such homes. In view of the great advances made in psychotherapy and the importance of this form of treatment, a psychological assistant physician has been appointed whose duties are almost entirely restricted to psychological investigation and treatment. Professor Robertson believes that psychotherapy, including psycho-analysis, is now settling down at last into its right place in medicine, and that, even if comparatively few psychoses are amenable to treatment by these means, they give us an understanding of the patient's symptoms and mentality useful in general treatment and management. Moreover, such insight is of the greatest value in preventing the development of definite mental disorder, provided persons come for advice and treatment at an early stage of their mental troubles. Amongst matters of general interest considered is that of the Church and healing—a subject which has been somewhat prominent lately. Professor Robertson's vigorous comments are written from an eminently common-sense standpoint. "At no time," he writes, "are the ministrations of the clergy of more influence and value than during prolonged sickness and even during periods of crisis. This is gratefully acknowledged by every physician. There exists a temptation, however, at such times, which a few clergymen appear unable to resist, of absorbing the professional sphere and the functions of the physician. These persons, though uneducated in medical science, which involves the most laborious training connected with any of the learned professions, pose as healers. . . . These practitioners, whose art is indistinguishable from a lukewarm Christian Science . . . cure by the possession of a mysterious 'gift of healing,' or by something not essentially different from the performance of a miracle, the initiation of which is their peculiar prerogative. No one limits the possibilities of spiritual or divine power, and the cure of all diseases, by whatever means, is through divine agency. But the laws of space and gravitation are no more an obstacle to this power than are those of anatomy and physiology, for mountains may be removed, yet we do not hear of the clergy initiating miracles in this sphere or performing feats of an engineering kind. When the foundations of the pillars supporting the dome of a great church subside . . . they open subscription lists and call in the services of an architect, yet they rush in to restore a temple not made with hands. We hope that Scotland, with its strong and pervading religious sense and with its famous medical schools, will be the last country in the world to regress to that primitive phase of civilization in which the functions of the priest and of the medicine man were in the person of one individual, whose pharmacopoeia consisted mainly of incantations and of magic for the treatment of every ill." The report contains some interesting observations on the notable diminution of deaths from general paralysis in England and Wales during the years 1919, 1920, and 1921. Professor Robertson suggests that the lessened consumption of alcohol and the early methods of treatment may be factors concerned in the remarkable decrease which has occurred. It may be observed that apart from the diminished number of deaths from general paralysis many psychiatrists have noted alterations in the clinical symptoms and course of the disorder. Many cases are atypical; remissions are increasingly common; and the total duration of the illness is often much longer than was formerly the case. A large number of these cases first showed signs of neuro-syphilis while in the army, and thus received treatment in the very early stage of the disorder. This may perhaps account for the protracted course of the disease. In discussing the treatment of service patients, Professor Robertson suggests that, in spite of the advantages of allowing the surplus of the pension to accumulate, a greater part of the pension should be utilized for treatment on a more liberal scale than at present, while the patient is in the mental hospital.

THE FATE OF THE CIVILIAN IN FUTURE WARS.

AN imaginative and idealistic sketch of future warfare was presented to the War Section of the Royal Society of Medicine, at its meeting on March 12th, by Colonel J. F. C. Fuller, D.S.O., General Staff Officer, Staff College, Camberley, in introducing a discussion on some of the medical problems of future warfare. Colonel Fuller (who is not a medical officer) declared that war, always more a psychological than a physical problem, had been wrongly regarded in the past as a competition in slaughter. With the development of psychological science it would be more truly envisaged as a struggle of mind against mind, or of genius against mental mediocrity, in which bloodshed and destruction would be reduced to a minimum. The element of destruction in warfare was not only non-essential, but even disadvantageous to the victors; the obsession to kill would be gradually eradicated from the military mind. During the last war it was not muscle but brains that decided the victory. The decisive weapons of the future would be ethical, economic, and only in a restricted sense military. Ethical warfare would rely upon highly organized propaganda directed to demolish the national will of the enemy and discredit his cause. Economic warfare would attack the national will by way of the national stomach. Military warfare would take the form chiefly of gas attacks from the air upon city populations; they would have the effect of temporarily paralysing but not destroying the community. The man who first thought of mustard gas deserved to rank with the discoverer of gunpowder. Chlorine gas was in a different category, but mustard gas would make it possible to wage war without causing widespread death or mutilation. Aircraft would be used on a large scale, not for explosive bombing, but to envelop the people below with some vesicant chemical which would render them incapable of resistance. Indeed, it might be that future war would take the form of anaesthetizing the enemy. He pictured 500 enemy aeroplanes over London putting London to sleep for forty-eight hours, and then landing enemy police, who, with the support of tanks, would control the situation until the surrender and indemnity were forthcoming. Such a manœuvre would be far more profitable to the enemy than wholesale destruction, and the defeated would not, save in dignity and possessions, be permanently damaged. Future warfare would be astonishingly rapid. The target would be the civil population. Upon that population war would break with the terror of a mental earthquake. Success would depend upon the delivery of the psychological "knock-out blow." Such warfare would mean an enormous increase in mental illness. What was known in the past war as shell shock would be widely prevalent among civilians. Part of the work of the medical profession in peace should be to prepare the public nerve for the shock of psychological attack. Each individual must have a first-aid outfit, not in his knapsack, but in his mind. If the public mind could be prepared for the character of future hostilities the attack when it came might fail because it would not produce the anticipated terror. It was only the unknown and unexpected

which caused the paralysis of fear. Civil practitioners must also be prepared to cope with tens of thousands of gas casualties, chemists must work at the discovery not only of new gases but of new antidotes, and every individual must have some instruction in the principles of self-protection against gas attack. So startling a vista rather took away the breath of members of the Section, but there was a brief discussion in which Colonel Fuller's views found some support. Lieut.-Colonel P. A. Anderson agreed that in future wars, whatever physical implements might be evolved, they would be a means to a psychological end. This would necessitate a psychological test on enlistment to eliminate the neurotic and unstable. The selected material should be carefully looked after, comforts provided as far as possible, the limits of physical capacity studied, and personal cleanliness ensured. Group Commander Martin Flack thought that Colonel Fuller had reckoned without the Royal Air Force, but at the same time he admitted the truth of some of his contentions, and urged the very real need of providing on a large scale for public protection against aerial gas attacks, especially that a large and cheap supply of oxygen should be available and supervised by a competent authority. Major-General Sir William Macpherson was doubtful as to the truth of Colonel Fuller's forecast, and wondered what place in such warfare there could be for the fighting army, what weapons it would carry, and what would be the functions of its medical service. His own hope was in the limiting and regulating effect of international conventions. Colonel Fuller, in his reply, described such conventions as scraps of paper, and regarded it as quite a delusion to suppose that anything done at the Washington Conference could prevent the use of gas. Lieut.-General Sir John Goodwin, who presided, said that he could not agree with Colonel Fuller in some respects, but it was a relief to him to think that he would no longer be Director-General of the Army Medical Service in the extraordinary situation which Colonel Fuller had developed.

AN ANTIVACCINATION MYTH.

An old antivaccination myth is being amusingly revived by the method of parliamentary question. One of the new Labour members asked a question as to a statement by the Ministry of Health in its vaccination pamphlet, attributing the existence of compulsory revaccination laws in Germany to the year 1874, which laws, according to the questioner, had existed in Prussia since 1834. Sir William Joynson-Hicks replied that the pamphlet was correct, the Prussian law of 1835 referring only to soldiers in the army. As related to day by our Parliamentary correspondent (p. 483), the questioner subsequently returned to the charge, but apparently in a somewhat modified form, the question now being whether strict Prussian regulations dating from 1835 had not resulted in vaccination and revaccination of the overwhelming majority of the victims of the epidemic of the early seventies. To this the answer was that the regulations in question related only to houses in which small-pox existed, and that there were no penalties unless small-pox occurred. The story now revived seems to have had its origin in an effort by a prominent antivaccinationist nearly forty years ago to find some kind of rejoinder to the remarkable demonstration of the value of revaccination contained in the Report of the German Vaccination Commission of 1884. The diagrams relating to it were published in the BRITISH MEDICAL JOURNAL of 1885, vol. ii, p. 408 et seq., and the report formed the subject of a valuable paper read to the Epidemiological Society in December, 1885, by the late Dr. E. J. Edwardes. Perhaps the most interesting thing about the antivaccinationist's contention was its sheer audacity. It involved a flat denial of a statement by Dr. Boeing, a member of the German Commission who was opposed to compulsory vaccination; he said in the Report of the German Commission (p. 39), "Before 1874 we had no vaccination law in Prussia." Dr. Boeing also spoke of "the influence of revaccination which we have first from 1875." The antivaccinationist's contention of nearly forty years ago involved also an assumption which would have been astounding had it not been preposterous. Holding as he did that the law dated from 1835, he cannot but have accepted the position that the German Government was doing practically an insane thing in appointing a Commission to investigate a law dating as from 1874, when the antivaccinationist supposed that the real date was 1835; that the Commissioners were equally insane in accepting such a reference and in publishing a great report on the basis of it; and that Germany and the whole civilized world have been none the less insane in accepting the report as a document having any relation to the facts. In short, the hypothesis that the revaccination law of Prussia dated from 1835, and not from 1874, was utterly wrong and ceased to require even contradiction; but after having been buried for decades it was exhumed in the parliamentary question which was asked on February 22nd. Notwithstanding that some effort has been made to cover the antivaccination retreat by speaking, in the later question, not of law but of regulations (of which the meagre scope and value was indicated in the parliamentary reply), we sympathize with the new M.P. whom the antivaccinationists have made the victim of the practical joke of putting into his mouth that question of February 22nd.

ALCOHOL IN ADOLESCENCE.

THE bill introduced by Lady Astor and read a second time in the House of Commons on March 9th is to a large extent the outcome of the efforts of primary school teachers, and the National Union of Teachers has passed a resolution in favour of the measure at its last two annual conferences. It has also had the support of the head masters and mistresses of several public and large secondary schools. It is practically the same bill as was introduced in the House of Lords, first by the late Lord Bryce, and afterwards by the Bishop of Oxford. It would make illegal the sale of intoxicating liquors to anyone apparently under 18 for consumption on licensed premises. As will be seen in the brief report in our Parliamentary columns the bill was passed in the House of Commons by a majority of 265 in a house of 405. It will, we believe, have the general approval of the medical profession, although, so far as we are aware, no overt action has been taken with the exception of a short manifesto issued on March 12th by Sir Thomas Barlow (formerly President of the Royal College of Physicians of London), Sir G. H. Makins (formerly President of the Royal College of Surgeons of England), Lord Dawson of Penn, and Sir Thomas Horder. They think that no valid objection can be raised against the bill, which can be considered quite apart from the principle of general prohibition. "There can be no doubt," they continue, "as to the desirability of employing all possible safeguards to prevent the danger of starting alcoholic habits in those who have just entered on the period of stress which puberty involves, and are on the threshold of adult life. Rapidly developing organs, new functions, and increased activities require all the protection that can be secured for them during that period, when readjustments of vital importance have to be made."

THE CENTENARY OF PASTEUR.

THE chief celebration in France of the centenary of Pasteur is yet to come. The culminating event will be the unveiling of a monument to him in the University of Strasbourg, where he was professor of chemistry from 1849 to 1854. The delegates attending the celebrations will assemble in Paris, and on May 25th will visit the tomb of Pasteur in the institute in Paris which bears his name. Later there will be a reception at the Sorbonne, and on the evening of the next day a reception at the Institut de France. On May 28th there will be a reception at the Hôtel de Ville, and on May 29th and 30th the delegates will visit Rheims and Verdun. The President of the Republic will visit Dôle on May 26th, Arbois

on May 27th, Besançon on May 28th, Mulhouse on May 29th, Colmar on May 30th, and will arrive at Strasbourg on May 31st. On June 1st he will unveil the monument, which is the work of the sculptor Larrivé. It is an obelisk 10 feet high, flanked by appropriate allegorical figures and bearing a medallion of Pasteur. In addition there is being erected at Strasbourg a permanent museum tracing the development of his scientific work through its various stages. A temporary collection will also be formed of apparatus and documents lent by Pasteur Institutes in Paris and elsewhere. An agricultural and industrial exhibition, illustrating the improvements which have resulted from Pasteur's work, will be open during the spring and summer, and there will be a series of congresses on tuberculosis, on child welfare, on maternity, and on cold storage. We have already reported the celebrations in Paris on the anniversary of his birth, and last week we published an illustrated account of the celebration at the Royal Society of Medicine in London on February 28th. There have been celebrations also in the United States and in many other countries. After that which took place in Brazil the Prefect of Rio de Janeiro directed that one of the main avenues of the city should bear Pasteur's name.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

THE first annual meeting of the International Society of Medical Hydrology was held at the house of the Royal Society of Medicine on March 8th, with Dr. Fortescue Fox, president for the year, in the chair. Members were present from Bath, Buxton, and Harrogate, as well as from France, Switzerland, and Czecho-Slovakia. A representative for Hungary was elected, making a total of eighteen countries represented; fifteen new members were also elected. A new rule was passed, widening the basis of membership in the society, to include all members of the medical profession interested in the subject. A letter from Professor Barduzzi of Siena was presented, advocating a more systematic teaching of hydrology. It was agreed to publish the *Archives of Medical Hydrology* (which are circulated in fifty-eight countries) three times in the current year. Dr. Ladislas Schmidt of Pistany, Czecho-Slovakia, read a paper by himself and Dr. Ed. Weisz on the use of hyperthermal radio-active mud as a method of home treatment.

THE officers of the Section of Medical Sociology have chosen "Mental Deficiency in its Social Aspects" as the subject for discussion in that Section during the Annual Meeting of the British Medical Association at Portsmouth next July.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Army Estimates.

THE ARMY MEDICAL SERVICE IN 1922.

IN the memorandum issued with the Army Estimates the Secretary of State for War makes the following reference to the Army Medical Service and the health of the army:

During the past year the number of patients in military hospitals in Great Britain has fallen from 2,348 to 1,770, and in Ireland from 1,055 to 139.

Hospital accommodation has been reduced to the extent of 1,700 beds in Great Britain and 1,770 beds in Ireland, the latter on the evacuation of troops from Southern Ireland. The military hospital at Chatham was closed in June last, and all sick of the military garrison there are now treated in the naval hospital, while at Gibraltar the naval hospital has been closed, and all naval sick there are treated in the military hospital, where the accommodation has had to be increased from 120 to 220 beds to enable this to be done.

The work of the Directorate of Pathology has made steady progress and the officers holding the appointments of assistant directors and deputy assistant directors of pathology in commands at home and abroad, who are in personal charge of the command laboratories, have made a number of valuable contributions to science. The precision of diagnosis so essential to successful treatment, and to all administrative measures directed to the prevention and control of infectious disease, is largely dependent on the work of these officers, and has reached a very high standard of accuracy.

The health of the troops has been excellent. Infectious diseases have decreased considerably, and the state of vaccination, in spite of all difficulties, has been satisfactory. Although there has been considerable incidence of small-pox among the civil population, no cases occurred among the troops.

The medical aspect of recruiting has received constant attention throughout the year, ensuring a higher degree of efficiency in the preliminary examination of the recruit, and fewer discharges on medical grounds, with resulting economy.

The New Minister of Health.

Mr. Neville Chamberlain, the new Minister of Health, is generally considered to come to his office with special qualifications for dealing with the problems of public health and housing reform. Indeed, it is only in these circumstances that he could have been expected to give up the comparatively pleasant position of Postmaster-General for the charge of a department which, through the crisis of housing decontrol, has become perhaps the most perilous in the Government. Mr. Neville Chamberlain is a younger brother of Mr. Austen Chamberlain, and did not enter Parliament until a few years ago. Previously, however, he had, like his father before him, devoted much attention to the administration of social affairs in the city of Birmingham. He became chairman of the Birmingham Town Planning Committee, and it was largely through his efforts, some ten years ago, that Parliamentary powers were obtained by the local authorities for dealing with the congestion of the population. Thus it was possible for the municipality to acquire land without stating its purpose, and to use it as it thought fit for building development. Loans can be made from the city fund to builders on a gradual scheme of mortgage, and a municipal bank can be established. As Lord Mayor of Birmingham Mr. Chamberlain proved himself a great organizer. Soon after he entered Parliament he was unfortunate in being called upon without notice and without resources to undertake the Ministry of National Service, an experimental Department which a very short experience showed to be unworkable for the purposes for which it was intended. Since then he has been quite content—until he was appointed, very recently, Postmaster-General—to be a private member, doing valuable quiet service on Grand Committees and in assisting the progress of several private bills. He is a clear speaker, but without any conspicuous rhetorical gifts. Indeed, it is rather as a business man with a keen interest in the betterment of mankind, disposed to move slowly and surely after obtaining thorough knowledge of facts, that he has distinguished himself.

Unemployment and Health.

Mr. Neville Chamberlain made his first speech as Minister of Health on March 8th, in replying to a debate on unemployment. He recognized that the prevalence of unemployment not only meant the infliction of great burdens and liabilities upon Boards of Guardians and the raising of rates of the local authorities with which his Department had to deal, but it affected also another function of the Ministry, that of improving the health of the people. He could not help thinking that the vital statistics of the last two or three years were a wonderful tribute to the work of the Ministry of Health and to the medical officers of health throughout the country. It might have been supposed that the results of unemployment would have been reflected in a great increase in the mortality rates, and especially in the infant mortality rates. Instead of that, all records had been broken in the opposite direction. It would, however, be a mistake to suppose that unemployment did not affect the health of the people. In particular it must affect the physique of the children. No one who had watched the children during the days of the war, when the working classes were earning high wages, could have failed to perceive the enormous improvements in their appearance and physique which were the results of the higher earnings of the period—improvements likely to be reflected in the future in a greater ability to resist disease. The Ministry of Health was vitally interested in the question of unemployment, and would with the Ministry of Labour do all it could to help forward schemes for its relief.

Sale of Intoxicating Liquor to Young Persons.

Lady Astor, on March 9th, moved the second reading of the bill introduced by her to make it illegal to sell intoxicating liquor to anyone apparently under 18 for consumption in a public-house. She mentioned that the bill was introduced previously in the other House by the Bishop of Oxford, and earlier by Lord Bryce at the instance of the teaching profession, which had the support of all organized women, including the National Council of Women, the National Women Citizens' Association, the heads of some of the great

public schools for boys and girls and of hundreds of elementary and secondary schools. They had also behind them some of the highest medical authorities. Lady Astor added that she had received 700 letters in support of it from women medical practitioners alone. As the law stood, a publican could sell beer to children over 14 for consumption inside a public-house as well as to be taken away. Spirits could be sold for consumption on licensed premises to young persons over 16. This bill, in limiting the age for sale for consumption, did not prevent young persons from fetching beer, neither did the bill touch clubs. The bill did not deal with treating. The whole of the colonies had this legislation, some making the restricted age higher. It was already adopted in Sweden, Norway, and Poland, and Lady Astor thought they had it in France. After debate for a full sitting, Lady Astor obtained the closure, and the second reading was carried by 335 votes to 70. The bill has been referred to Standing Committee C.

Vaccination in Germany.—Mr. Sullivan followed up the question he asked on February 22nd (BRITISH MEDICAL JOURNAL, March 3rd, p. 393) by another designed to indicate that the pamphlet on vaccination issued by the Ministry of Health was inaccurate. His question suggested that a decline in small-pox attributed in the pamphlet to a German Act of 1874 had then already taken place, and put forward the contention that, owing to strict Prussian regulations dating from 1835, the overwhelming majority of the sufferers in the great epidemic of 1871 had been vaccinated and revaccinated. Sir W. Joynson-Hicks, in reply, vindicated the accuracy of the pamphlet, stating that he was aware of the Prussian regulations referred to; that, according to a memorial prepared in the German Imperial Office of Health, and published in Berlin in 1896, those regulations provided for compulsory vaccination only in the event of an actual outbreak of small-pox in a house; that no penalties were provided for omission of vaccination when small-pox had not occurred; and that the total deaths from small-pox in the German Empire in 1871 and 1872 were officially stated to be 162,111. He had no information as to the total mortality in Prussia at that time, or as to the vaccinal condition of the cases, and referred Mr. Sullivan for further information to the evidence as to the Prussian regulations given by Dr. Arthur Hopkirk of Jena before the Royal Commission on Vaccination in 1889.

Vaccination Debate.—Dr. Watts, on March 6th, gave notice to call attention that day fortnight "to the serious danger which may arise owing to the lax manner in which the Vaccination Acts are at present administered, and to move a resolution." As, however, Dr. Watts has only fourth place on the Order Paper for that evening, it is unlikely that the subject will be reached.

Insurance Committees.—Sir W. Joynson-Hicks informed Dr. Watts, on March 7th, that there were 128 Insurance Committees in England, with an aggregate membership of 3,130. In 1922 the total expenditure on travelling was £2,065, and the payment for subsistence and loss of remunerative time was £1,658. The Insurance Act, 1921, reduced the minimum membership from 40 to 20 and the maximum from 80 to 40; the revised limits had not been in operation sufficiently long to indicate whether any further reduction in the size of the committees was practicable.

Registrar-General's Report.—Dr. F. E. Fremantle asked, on March 7th, if the Registrar-General's annual report for 1921, containing matter of first importance affecting the welfare of the people, would be presented to Parliament. Sir W. Joynson-Hicks said that this publication, along with others, was now issued as a Stationery Office publication instead of a command paper, but this would not interfere with its presentation to Parliament, which was being arranged forthwith.

Death Certificates.—Dr. Chapple asked the Home Secretary, on March 8th, whether the City Coroner had said that doctors should not sign death certificates if they had seen the patient only for the first time two hours before death; whether instructions to this effect had been issued by the Department; and whether, in view of the fact that such a policy would greatly increase the number of inquests involving *post-mortem* examinations without adequate justification, he could state the average cost of such inquests. The Minister of Health (Mr. Neville Chamberlain) in a written reply said that no such instructions had been issued. He had no information as to cost of inquests involving *post-mortem* examinations, but would make inquiries.

Pharmacy Bill.—Mr. O'Grady, on March 8th, introduced a Pharmacy Bill "to regularize the position of all persons trading as chemists and druggists or pharmacy store proprietors in the sale of drugs, the dispensing of doctors' prescriptions and the sale of patent medicines." The measure was backed by Lieut.-Colonel Watts-Morgan, Mr. Tillett, and Mr. John Jones on behalf of the Labour party. The bill has since been printed. We propose to give some particulars in our next issue. As a private member's bill it seems to have little chance.

Pensions Regional Headquarters at Nottingham.—Replying to several members of Parliament, Captain Craig stated, on March 13th, that the Minister of Pensions, in view of the actual and prospective reductions in work, was considering economical modifications in administration. The minutes contemplated the transfer of the East Midlands Regional headquarters to Birmingham. This transfer would not cause inconvenience to pensioners, since it would not disturb the existing arrangements in that region for local area officers, medical boards, or treatment. Captain Craig added, as to the staff at the East Nottingham Regional headquarters, that the services of such members as were no longer required would be dispensed with gradually, reasonably long notice being given to individuals concerned.

War Losses and Burdens.—The Chancellor of the Exchequer has given particulars of British losses in men and money during the war. The particulars with regard to losses in men are as follows:

British Empire Casualties.

	Men enrolled.	Killed.	Wounded.
United Kingdom	6,211,427	743,702	1,673,262
Dominions and Colonies ...	1,615,527	140,923	357,785
India	1,679,416	61,398	90,859
Total	9,496,370	946,023	2,121,906

The expenditure from April 1st, 1914, to March 31st, 1919, was £9,590,000,000. Of this amount £1,820,000,000 was raised by direct and £910,000,000 by indirect taxation, and from other sources of revenue: £6,860,000,000 was raised by borrowing—£5,500,000,000 at home, and £1,360,000,000 abroad. War loans to allies amounted to £1,494,000,000, and to the dominions to £150,000,000. During the year 1922 the Dominions and Colonies have repaid £1,189,935.

Small-pox in the British Army.—On inquiry by Mr. Hancock, on March 8th, Lieut.-Colonel Guinness regretted that, owing to the volume of work involved, small-pox statistics of the British Army for the period from the outbreak of war were not yet available, but the figures for the preceding period were given, commissioned ranks not being included. The period dealt with is five and a half years from the beginning of 1909 until the middle of 1914. In the United Kingdom there were in that time neither deaths nor admissions from small-pox in a force of the average strength of 124,172. In India, with an average strength of 72,664, the admissions in the five and a half years were 66 and the deaths 5. In Egypt the average strength was 5,755, and the total small-pox admissions were 2, of which 1 was fatal. In the Colonies the corresponding figures were—strength 35,072, small-pox admissions 2, and deaths none.

Medical Officers of the Ministry of Health.—Mr. Neville Chamberlain stated, on March 12th, in answer to Mr. Short, that the number of medical officers now employed by the Ministry of Health is 56, and the salaries, including bonus, amount to £62,504. In addition, there are 35 regional medical officers employed whose salaries amount to £46,125, which sum is now recovered from the approved societies. In March, 1921, the medical staff of the Ministry, including the regional medical staff, was 101, whose salaries, including bonus, amounted to £130,630, the whole payable from Exchequer funds.

Medical Officership for Hindley.—Dr. Watts asked, on March 7th, whether the Minister of Health intended to sanction the appointment of a medical officer of health which was made by the urban district council of Hindley on January 15th last; if he was aware that although there were at least eleven applicants holding the diploma of public health the council selected an applicant who held no diploma nor had the minimum of experience which was laid down in the Sanitary Officers' Order of 1922 to meet the case of a medical officer of health who, although not having a diploma, had had practical experience of the duties of a medical officer of health. Sir W. Joynson-Hicks said the Minister was aware of the fact stated in the question, and had intimated to the Hindley urban district council that he was not prepared to approve their selection of a candidate not possessing the required qualifications. The council had been requested to consider the matter with a view to making a suitable appointment in accordance with the Sanitary Officers' Order, 1922.

Death Rates in Mental Hospitals.—Asked by Mr. Lansbury, on March 12th, as to the high death rate prevailing in the Powick Mental Asylum in certain years, Mr. Neville Chamberlain replied that the death rates for the years in question at Powick Mental Hospital were as follows (the rates for all county and borough mental hospitals in corresponding years are given in brackets): 1916, 11.2 per cent. (12.5); 1917, 22.7 per cent. (17.3); 1918, 32.6 per cent. (20.2); 1919, 12.7 per cent. (12.7); 1922, 6.7 per cent. (9.0). It would be seen, he said, that in only two years—that is, 1917 and 1918—were the rates higher than the mean for all asylums. The increase for those years caused much anxiety at the time; it was due to an outbreak of tuberculosis; the death rates from this cause in 1917 and 1918 were 74 and 162 per 1,000 of the population of the asylum. Two commissioners of the Board of Control made a special inquiry into the matter. They found that the outbreak was due mainly to two factors: (1) subnormal (war) feeding and (2) defective segregation, the result of overcrowding due to war conditions. It was satisfactory to note that by 1919 the death rate from all causes at Powick had drawn level with the mean for all asylums, and that in 1922 it was much below it.

Answers in Brief.

Mr. Neville Chamberlain has announced that the order as to special designations of milk will be reconsidered in consultation with the parties interested and reissued with the necessary amendments.

The number of persons, excluding casuals, who were being relieved in institutions provided by Poor Law authorities, was 214,000, and the number of beds in those institutions approximately 282,000.

The Ministry of Labour cost of living index number showed an increase of 80 per cent. over the pre-war level at November 1st, 1922, and of 77 per cent. at February 1st, 1923.

Sir W. Joynson-Hicks has stated that the residential accommodation for the treatment of tuberculosis under the schemes of local health authorities in England (which at present comprised upwards of 19,000 beds) had increased during the past two years by approximately 2,350 beds, while some thousand additional beds were in course of provision.

Of some six thousand medical men employed in the Pensions Department on boarding duties, only 299, or 5 per cent., had had no war service, and of these the large majority were specialists for whom no efficient ex-service substitute could be obtained.

Canada.

McGill University.

A change has been made in the length of session for medical students. The session of 1923–24 will start the beginning of the fourth week of September instead of in the first week of October. The entire medical course has been lengthened: the first two years will be spent in the Faculty of Arts, where a revised course, with special attention to languages, will be given; the following four years will be completely occupied with lectures and clinics in the Medical Faculty; and the seventh and last will be spent wholly in hospital. With reference to the two-year pre-medical course, the following extract from the minutes of the Faculty of Arts under the date of January 5th, 1923, will be interesting:

The Faculty considered the report of the conference between the B.A. Advisory and B.Sc. Advisory Committees of the Faculty of Arts and the Education Committee of the Faculty of Medicine. The following points were agreed upon:

1. That there would be no difficulty about the Faculty of Arts undertaking the proposed curriculum of the first year, though it was understood that this would probably involve additional instruction in mathematics, French, and Latin.
2. That the curriculum of the first of the two pre-medical years should be revised by the striking out of the words "including mechanics" after mathematics.
3. That in physics the first-year course should be the same as that given to the Arts students (three-hour course).
4. That additional instruction would be needed in chemistry, but that no additional instruction would be necessary in the department of physics and biology.
5. That the second year as well as the first should be under the control of the Faculty of Arts, but that there should be an advisory committee consisting of the professors giving the courses in biology, chemistry, and physics in the second year, the function of the committee being to keep the Faculty of Arts in touch with the views of the Faculty of Medicine in regard to the content of these courses.

Toronto University.

Dr. Oskar Klotz, who graduated in medicine at McGill in 1906, and has recently been engaged in reorganizing the pathological department of the University of Buenos Aires under the direction of the Rockefeller Foundation, has been appointed to the chair of pathology in the University of Toronto, left vacant by the death of Dr. J. J. MacKenzie. Dr. Klotz, who was formerly a member of the teaching staff of the Medical Faculty of McGill University, became professor of pathology in the Rockefeller Institute in 1910, and was at one time director of the Magee Pathological Laboratory, Pittsburg.

Death of Sir Thomas Roddick.

Sir Thomas George Roddick died at his residence in Montreal on February 20th. By his death Canada loses one of its foremost surgeons. He graduated from the Medical Faculty of McGill University in 1868, and continued his connexion with the university in various capacities, as lecturer in hygiene, demonstrator in anatomy, professor of clinical surgery, Dean of the Faculty, and lastly as one of the governors of the university. Sir Thomas was the first colonial President of the British Medical Association, and presided over the Annual Meeting in Montreal in 1897. In 1896 he was elected to the House of Commons for St. Antoine division in Montreal, and held the seat until 1904. It was chiefly owing to him that the Canada Medical Act was finally passed in 1911; by this Act the Medical Council of Canada was formed, containing a representative from each province, with Sir Thomas as president. An obituary notice appears at page 489.

Medical Council of Canada.

Written examinations will be held in Toronto, Winnipeg, and Vancouver, beginning on June 12th, 1923. Applications for permission to write these examinations must be sent in to the registrar, Dr. Robert W. Powell, 180, Cooper Street, Ottawa, Ontario, not later than May 26th, 1923.

Scotland.

Investigation on the Results of Gastro-enterostomy.

The Scottish Committee of the British Medical Association recently appointed a special committee to inquire into the results following the operations of gastrectomy and gastro-enterostomy. Local committees are also in process of formation at the four university centres in Scotland with the view of collecting statistics of these operations. A schedule has been drawn up containing two pages of the headings under which information is desired, and this should greatly facilitate the setting down briefly of details from the records of cases. Copies of the schedule will be issued shortly to hospital surgeons and others willing to co-operate in the inquiry, and at a later stage, in cases where complete histories are not on record, efforts will be made to complete them by communicating with the medical attendant. It is hoped that the inquiry may be conducted on a wide basis, and it ought to be feasible to get from Scottish statistics the records in at least 5,000 cases of these operations. The results of such an investigation should be of very great value to medical opinion and practice.

New Edinburgh Hospital Buildings.

The plans have now been passed for a new maternity hospital to be erected by the trustees of the hospice facing the King's Park. This hospital will form the Dr. Elsie Inglis War Memorial, and will cost approximately £30,000. A laboratory and *x*-ray block for the branch of the Royal Victoria Hospital for Tuberculosis at Liberton has also been approved. It is intended that research work on tuberculosis shall be carried out here; the cost of the building, irrespective of apparatus and fittings, will be about £6,000.

Glasgow Royal Infirmary Club.

The annual business meeting and dinner of this club was held on the evening of March 9th, in Ferguson and Forrester's, Buchanan Street. Mr. Henry Rutherfurd presided over a very representative gathering of about sixty members. The toast of the evening, "The Royal Infirmary," was given from the chair, and was responded to by Mr. J. Hogarth Pringle. "Past and Present Residents" was proposed by Dr. John Henderson, and the respective replies were made by Drs. John F. Fergus and Paton Neilson. The toast of "The Chairman" was given by Mr. Thomas Kay, and Mr. Rutherfurd suitably replied. The enjoyment of the evening was greatly enhanced by songs from Drs. William Scott, W. A. Sewell, O. H. Mavor, and George Dalziel, and humorous recitations by Drs. Adam Patrick, John F. Fergus, and W. A. Sewell. Mr. R. H. Parry was appointed chairman for next year, and Drs. W. A. Sewell and J. K. Rennie were appointed joint secretaries and treasurers. During the evening, as in former years, a collection was made for the Royal Medical Benevolent Fund, and a sum of over £6 was forwarded to the British Medical Association for transmission to the Fund.

England and Wales.

Leicester New Health Offices.

The new public health offices of Leicester were opened on March 9th by Sir George Newman, Principal Medical Officer to the Ministry of Health. In acknowledging the great amount of useful and enduring work that Dr. Millard and Dr. Warner had done for Leicester, Sir George Newman said that in the last forty years the death rate of Leicester had been reduced from 21 to 12 and infant mortality from 201 to about 86. Every child born in Leicester to-day had twelve years more expectation of life than its grandparents. The invalidity which was endured by suffering humanity had been reduced, and the total capacity and happiness of the citizens had been increased. Compared with forty years ago, there was now a totally new conception and a larger and more splendid vision of what the health of the nation really meant. Dr. Millard's report had spoken of the new and hopeful spirit of preventive medicine, and Sir George Newman pointed out that that was not the monopoly of the public health services, but the opportunity of all medical and voluntary services. In the new health

offices the sanitary inspector's office and the tuberculosis consulting and waiting rooms are on the ground floor; on the first floor are the offices of the medical officer of health, the tuberculosis officer, and others; on the second floor are the office of the infant welfare medical officer and the offices of the health visitors; the third floor has not yet been fitted up, but it is suggested that it should be used for chemical and bacteriological laboratories. Hitherto the tuberculosis department has been carried on in separate premises.

MANCHESTER MEDICAL OFFICER OF HEALTH.

To meet the new medical officer of health of Manchester, Dr. R. Veitch Clark, over two hundred medical practitioners of Manchester assembled in the Lord Mayor's parlour at the Town Hall on February 28th. Invitations had been sent out to all the practitioners of Manchester, but professional duties kept a number away. The Lord Mayor, in introducing Dr. Clark, described the occasion as a unique gathering of the medical profession in Manchester, designed to provide a link between the new medical officer of health and the medical profession generally. Dr. Clark said that there was nothing more fundamental to the success of modern preventive medicine than whole-hearted friendship and co-operation between the administrative branch of the medical profession in the city and those who practised among the citizens. His ideas as medical officer of health would not be revolutionary. He felt very strongly that the primary function of the department for which he was responsible was one of prevention. In working together whole-heartedly the medical profession was following on the lines which would in the end produce the greatest benefit to the public, and was also acting in its own best interests.

A SPA TREATMENT ESTABLISHMENT AT LLANDRINDOD.

The Priory for Wales of the Order of St. John of Jerusalem has opened a Spa Treatment Establishment at Llandrindod Wells for disabled ex-service men under the Ministry of Pensions, and also for the civil community. The object is to place the waters and balneological equipment of this famous Welsh spa at the disposal of those who are unable to bear the expenses such treatment ordinarily entails. Llandrindod is frequented particularly by patients suffering from rheumatic and gouty conditions, neuritis, colitis, obesity, skin disorders, diseases of the gastro-intestinal system (especially following residence in tropical climates), dyspepsia, and debility. Cases of infection or of an incurable nature will not be accepted at the establishment. The patient will pay an inclusive fee, which will cover board, residence, and all other necessary expenses for the complete course of treatment. Full particulars may be obtained from the secretary of the establishment. It is stated also that the Priory for Wales is negotiating with the Admiralty for the taking over of the Royal Naval Hospital, Pembroke Dock, for ex-service men in the counties of Pembroke, Cardigan, and Carnarvon.

Ireland.

CITY OF LIMERICK MEDICAL ASSOCIATION.

AT a recent meeting of the City of Limerick Medical Association, which consists of members of the British and Irish Medical Associations as well as members of other medical bodies, the annual report of the activities of the association was read. For many years it has been known that the medical profession in Limerick is the best organized in Ireland. The secretary, Dr. W. J. O'Sullivan, sets out in the report the chief achievements of the Limerick Association; they show clearly what organization can do. The most notable is perhaps the fact that ten of the principal life assurance companies operating in Ireland pay two guineas for medical examination in life policies. In Dublin and Belfast the fee paid to medical practitioners for the same work is one guinea. Another instance is that medical referees under the National Insurance Act are paid at the rate of two guineas for each case examined. In this respect it may be mentioned that there are no whole-time medical referees under the Insurance Act as it applies to Ireland. There is, however, a fund, under the control of the Irish Insurance Commission, out of which fees are paid to medical practitioners who are called in to give second opinions. The report gives also a list of the correspondence which took place during the year, and includes letters addressed to Dr. Philip Lee (Cork), Dr. Hennessy (Irish Medical Secretary, British Medical Association), the Secretary of the Child Welfare Scheme, and others.

POOR LAW OFFICERS' SALARIES.

The Lurgan Guardians recently considered a communication from the Ministry of Home Affairs, Northern Ireland, relative to the salaries of the medical officers of the union. This was in reply to a copy of a petition forwarded by Dr. J. S. Darling, medical officer of the workhouse (on behalf of the medical union staff). The Ministry told the Guardians that careful consideration should be given to the salaries of the medical officers of the union, that these could not be regarded as other than inadequate, and not in proportion to what had been considered in the great majority of the unions in Northern Ireland fair and reasonable for medical officers, and that the Guardians should take steps to grant an improved scale of salaries. The matter was referred to the Finance Committee to deal with and report to the Board.

Correspondence.

THE DANGEROUS DRUGS REGULATIONS.

SIR,—A point in the Dangerous Drugs Regulations, which seems to have escaped notice in the recent correspondence in the JOURNAL, appears to me to require careful consideration.

In the Memorandum of the Home Office published on page 69 of the JOURNAL of January 13th, paragraph 6 authorizes a practitioner to be in possession of the drugs, "so far as is necessary for the practice of his profession," and the letter of Sir Malcolm Delevingne on page 73 of the SUPPLEMENT of March 3rd at the end of the penultimate paragraph states: "A duly qualified medical practitioner is a person authorized . . . to be in possession of the drugs so far as is necessary for the practice of his profession, and he can therefore—if in practice—buy the drugs. . . ."

The words "if in practice" are being interpreted by the chemists in such a manner that whole-time administrative medical officers in the public health service cannot obtain any of the drugs even in emergency, since their work, being largely administrative, is not considered by the pharmacists as practice.

Surely a retired or a full-time medical officer, if called to a patient in emergency, is in practice just as much as the medical man who, having put up a name-plate, is called to his first patient. Is the last to be prevented from having a supply to use in emergency, since he is obviously not in practice until he is called to a patient?

I am of opinion that the Home Office having drafted the Regulations to deal with a very small class of practitioner—namely, the "dope fiend"—has forgotten the elements of logic, a first principle of which is "a particulari ad universale non valet consequentia."—I am, etc.,

Wolverhampton, March 13th. H. CARTER MACTIER, M.B.E.

SIR,—I have to thank Mr. E. B. Turner, Chairman of the Medico-Political Committee, British Medical Association, for his courteous, full, free, and frank statement in your issue of February 17th. I fully recognize the work done by the Committee. Mr. Turner states "while this meeting was in progress a message was brought in from the Home Secretary announcing that he had decided to appoint a Select Committee as requested. As a result of the deliberations of this body *the regulations were reintroduced in a very much more satisfactory form, to which no objection was taken by the Council of the Association.*" The italics are mine. It is clear from this that the Council of the Association did not object to the regulations as they are while they still considered them objectionable. It is clear that they compromised with the political dialecticians on a matter of principle. Most of us have no objection to compromise on matters of detail; but we should never compromise on matters of principle. We should say to the Home Secretary, "No, you pass the regulations, in spite of our refusal to agree, and accept the responsibility. We are responsible to ourselves and to the profession, and we decline to accept a shadow of responsibility for regulations which we do not fully approve."

About these regulations the politicians can and of course do tell us that they were passed after the profession had endorsed them, and what can we say but admit the fact? It is time for the profession to wake up and see to their interests and to their independence in these days when communistic legislation is invading every sphere of human action.—I am, etc.,

HENRY SMITH, C.I.E., Lieut.-Col. I.M.S.(ret.).

Sidcup, Feb. 27th.

SIR,—The reply of the Assistant Under Secretary of State, Home Office, regarding the "Dangerous Drugs Regulations," noted in the SUPPLEMENT of March 3rd, suggests that the new regulation was actually framed against all medical men who have retired from practice, so that no retired medical man can keep in his house a small quantity of laudanum, or a pocket case of hypodermic drugs for a sudden emergency. Yet the retirement of a doctor does not preclude him from being called up by any case of sudden illness or accident occurring in his immediate neighbourhood; for we all know that in a case of life and death time is of the utmost importance, and the nearest medical aid will be sought.

It is also a disgrace and a slur on the retired medical men that they are considered utterly unfit to keep a few anodynes in their house; after practising their profession for thirty or forty years they are, when retired, to be looked upon as victims of the drug habit.

I think the Medico-Political Committee might try and get an amendment in the regulations, or a special permission obtained from the Home Office that a retired medical man may be in possession of a small quantity of anodynes for emergencies.—I am, etc.,

March 12th. H. D. J.

*** This matter is referred to in an article at page 477, and in a Current Note in the SUPPLEMENT.

DR. HALDANE'S CONCEPTIONS OF BIOLOGY.

SIR,—In your issue of March 10th (p. 441) "C. A." asks whether I might not with advantage have substituted the words "machine" or "machinery" and "mechanical" for "mechanism" and "mechanistic." I think, however, that there is justification for the latter words. When we speak of the "mechanism" of a steam engine or a kidney we mean not only the machinery but also the manner in which it works; and a "mechanistic" theory of renal secretion is a theory that renal secretion is the outcome of mechanism.

I must admit that the word "environment" used by me is clumsy. The French "milieu," as used by Claude Bernard, is much superior; but I have had to accept what ordinary English usage has given me. The only alternative word seemed to be "medium." I feel sure that this would not satisfy "C. A." any more than it does me.

To the deeper questions raised in the letter of "C. A." I shall not attempt to reply here; but it may be of interest to those who wish to know my opinions that I have attempted to discuss some of these questions in an article on "Natural Science and Religion" in the forthcoming number of the *Hibbert Journal*.—I am, etc.,

Oxford, March 11th. J. S. HALDANE.

PSYCHOLOGY AND MEDICINE.

SIR,—The address on Psychology and Medicine by Sir Frederick Mott published in the last number of your JOURNAL is not only admirable for its wisdom, clarity, and diction, but is most stimulating and suggestive in many directions.

His allusion to Lucretius—and he might have added Steognis of Megara, Plato, and Aristotle—seems to point the moral that the brotherhood of medicine and psychology should, in these days, also include sociology.

The laws of heredity in their bearing upon the causation of the various psychoses and degrees of feeble-mindedness, apart from certifiable insanity, surely demonstrate that they have an intimate and practical connexion with the well-being of society and the maintenance of the quality of our race. It is remarkable that medicine has hitherto shown no apparent recognition of this connexion, has given no lead to the legislature and to the public by demonstrating it, no warning as to the possible or even probable danger of ignoring it.

It would be most interesting if Sir Frederick Mott could tell us whether he is apprehensive, for instance, about the differential birth rate in this country between the intelligent and capable normals and the unintelligent lower-grade morons; whether our statistics show any resemblance to the American Army figures of Yerkes; whether he thinks that as modern civilization has with the help of scientific medicine inhibited the effect of natural selection, we should try to build up some form of rational selection as a substitute; whether in fact our system of segregation should include others, in addition to certified cases, so as to preserve the quality of our race and anticipate a tendency towards fatal deterioration.—I am, etc.,

Brighton, March 11th. ROBERT SANDERSON.

HOSPITAL POLICY.

SIR,—The chairman of the Hospitals Committee has devoted a long letter to a claim of wonderful foresight on the part of the British Medical Association in that the Hospitals Commission has adopted its definition of a voluntary hospital. Surely it was obvious to the man in the street that the so-called voluntary hospitals had, by force of circumstances, changed their character: that while originally instituted and supported by voluntary contributions (hence the title), they were no longer able to pay their way as charities, and were compelled to accept payment from patients who, either directly or indirectly, were able to pay for treatment.

The new meaning attached to the word "voluntary" is merely camouflage, which does not hide the fact that the hospitals have become an increasing factor in competition with private practice, both general and specialist. If the British Medical Association has not deliberately shut its eyes to this fact, it is its duty to discuss it openly, instead of wasting its time finding a definition which will save the faces of those who are willing to exploit the profession. The hospitals are now using the old weapon of contract practice, which in the past has proved so deadly to medical prestige, and it will require more than "voluntary management" to protect the profession from its insidious effect. For instance, it is stated that approved societies are ready with £200,000 a year for the hospitals. No one can help being pleased to hear this, but has anyone asked how much of that sum will go to the doctors who do the work?

The only rational policy for the British Medical Association is to draw a sharp distinction between work done for charity and work which can be paid for, and apply to the latter the cardinal principles which were the watchword of the Association at the institution of the Insurance Act. If it fails to do this the result may well be disastrous. I hope I shall not be able to write, "I told you so."—I am, etc.,

Bury, Lancs, March 11th. J. C. TURNBULL.

SIR,—I wonder if Mr. Bishop Harman or anyone else would enlighten your readers about the supposed wonderful virtues of the "*independent and voluntary management*" *of our hospitals*. What do they mean by it?

Take an ordinary provincial hospital. Its board of management is elected by the subscribers at the annual meeting, and is responsible to them, just as members of a town council are elected by and are responsible to the ratepayers. Of course, the one has life vice-presidents, who have perhaps subscribed a hundred guineas, and the other has aldermen. The hospital has its paid secretary. The town council has its paid town clerk. Both have their staffs of paid employees, only the council pays its employees better and their hours of work are more humane. It is a hundred to one that most of the members of the board of management are in other capacities elected representatives of the people—for example, town councillors, or county councillors, etc. The medical profession will be represented by certain representatives of the medical board, small in number but great in influence.

Now I want someone to explain to me what would be the difference if the hospitals were financed more or less by the State or municipality, and the hospital board of management consisted of such a body as that which has been elected to distribute the Government subsidy. Personally, I do not care a straw how the hospitals are financed, as long as it is done economically and efficiently, which no one can say is the case at present. As a member of the medical profession I am keenly interested in preserving the status of the profession, in seeing that it is adequately remunerated, and that every member of the profession should have a fair and equal chance of becoming a member of a hospital staff; and, further, that those members of the profession who are not

on hospital staffs shall have every facility offered to them to preserve their familiarity with hospital work and with every advance in professional knowledge.—I am, etc.,

Helston, March 12th. FERDINAND REES.

SIR,—May I encroach on your space in order to congratulate Dr. John Fletcher upon his excellent letter appearing in your issue of March 3rd? After a protracted series of controversial letters and addresses written and delivered upon a bewildering number of side issues, a statesmanlike view of the problem in its entirety and a sincere attempt to point a broad path to its solution are more than welcome, and are in themselves a reproach to querulous bickerings on such matters as "staff funds" and "maintenance costs."

The main point of a "hospital policy" surely must be to keep the hospitals open. Only second to that comes the duty of improving them. We find, as a matter of fact, many hospitals struggling under a crushing debt, and a few which have actually had to curtail the number of beds, and that even this position is only achieved after special appeals, lotteries, and competitions. The most discouraging consideration of all is that even by keeping open a fixed number of beds a hospital is in reality fighting a losing battle since an ever-increasing population demands a corresponding increase of hospital accommodation. As for the secondary duty of improving hospitals, he would be a bold man who talked to the average committee these days about improvements.

The question is purely one of finance. If voluntary subscribers cannot, or will not, shoulder the financial burden involved by the normal steady growth of hospitals, then what remains? Who else can shoulder it if not the State? Surely it is our duty to press before the public the fact that there is at least a very grave possibility of a generally enfeebled hospital service if the present financial system is carried on unaided, and also to endeavour to formulate an alternative scheme.

It is certain that sooner or later we shall have a Government with views and aims differing from those of the present administration, and probably with ideas of its own on the subject of hospitals. Those views on general principles will probably take the line of "so many people, so many beds, so many doctors." Surely it would be only the most common prudence to formulate a scheme, in advance of such a day, for the common help and guidance of Government and profession.

Many doctors propound a baffling proposition that State aid for a hospital would immediately cause a peculiar form of cerebral atrophy in the staff, resulting in the loss of all desire for doing good and original work, both clinical and pathological. Especially do they fear a complete loss of "initiative." All the evidence is happily against such a state of affairs. During the war magnificent work, both individual and co-ordinated, was performed by a profession working directly for the State. Within the last few years tropical medicine has been converted from a sort of chaotic mythology into a science, mainly by the labours of gentlemen in public employ. Our public health service is respected throughout the world, and, again, is staffed by public servants. The recently opened Maudsley Hospital is to be supported mainly by public money, but nevertheless was widely welcomed as an institution certain to be of great value. The list could be extended indefinitely.—I am, etc.,

March 7th. JUNIOR.

BRITISH SPAS: THE NEED OF SCIENTIFIC CO-ORDINATION.

SIR,—Six years ago, in a lecture before the Royal Society of Arts, one of us ventured to point out what he conceived to be the promising possibilities of British hydrology, if the resources of our country were organized in a scientific spirit, and if this department of medical knowledge were given academic recognition.

At present both those who provide and those who carry out the various methods of treatment at the British spas have an exceptionally difficult task to perform, because they are to a large extent isolated. We do not perhaps realize what a wealth of material, how much time and thought and money, what persevering energy and devotion go to the making of a modern spa; and, on the scientific side, what careful study of methods of treatment is required in the most difficult class of cases and, above all, what alertness to new impressions and new knowledge. Recent years have increased all these demands.

There is now happily in some quarters a unifying leaven at work. It is recognized that rivalries and jealousies are a gratuitous aggravation of difficulty and block the way of progress. It is becoming evident that there can be no real rivalry between the British spas because each of them is endowed with waters and climate of a different type. For this reason the proper development of each spa must follow individual lines. When this natural differentiation has been agreed and worked out a great step will have been taken in the history of British waters.

The British Spa Federation has made a fine beginning in the work of co-ordination on the business side. Representatives of the principal spas are now brought together in periodical meetings, with authority to deal with many problems of a technical and business character, and of course a united propaganda. Those who know something of the hard work that has been devoted to this patriotic effort must wish it complete success. Undoubtedly without an enlightened policy of this kind the actual treatment, which is, of course, more interesting to medical men, would now be difficult to carry on.

On the scientific side there is as yet no unifying or co-ordinating influence at work. We stand exactly where we did six, or for that matter sixty, years ago. One sees praiseworthy but isolated endeavours by spa practitioners to perfect themselves in the branch of medicine in which they are engaged. One even sees here and there unassisted efforts at research into the action of waters and baths, but nowhere an organization for study or instruction. And yet if an art is to be practised, surely it should be taught. What can be the future of the spas if the young scientifically minded medical man is not attracted to them? The scientist at the spa cannot be dispensed with. How little do our senior students and junior graduates know of the wealth of opportunity awaiting them in the study and use of physical methods of treatment—for example, of the astonishing effect of external treatment in chronic disease, of the fascinating study of the manifold reactions aroused in the body by physical agencies? And again, in the present absence of teaching, what can the physician or the general practitioner know of the principles of medical hydrology and of their practical application in England, that he should prescribe a course of waters to his patients? Here, as elsewhere, he must understand the value of treatment before he can recommend it.

It may be said that such matters belong to the post-graduate period. But it may fairly be claimed that those who wish to make a study of medicinal waters and baths should have the means of doing so both before and after graduation. In France, Italy, and Germany every year, with official and academic authority, study tours—often following a systematic course of lectures—are planned to the chief spas, where interesting discourses and demonstrations are arranged. To the medical youth in these countries is thus given an opportunity of a personal study of the accepted methods of treatment by waters and baths. The new generation begins where the old leaves off, and both science and practice are assured of an orderly progress. Many older practitioners also avail themselves of these study tours.

In England none of the proposals that have been put forward during the last twenty-six years to initiate a similar teaching of medical hydrology have as yet borne fruit, the latest and most serious proposal in 1914 being held up on account of the war. Now that men's minds are again seriously considering the problems of peace, perhaps this matter also may be dealt with. Will the Ministry of Health and the medical schools, in the public interest and in the interest of science, accept any responsibility for the medical use of waters and climates? Upon the answer to this question will depend, *inter alia*, the scientific development and the efficiency of the British spas.—We are, etc.,

R. FORTESCUE FOX,
President of the International Society of Medical Hydrology;
J. CAMPBELL MCCLURE,
President of the Section of Balneology and Climatology of the Royal Society of Medicine.

London, W., March 7th.

IONIC MEDICATION.

SIR,—In your issue of March 10th (p. 409) there is a paper by Dr. David Campbell, giving his opinions as a result of a serious attempt to estimate the value of ionization treatment. Since he makes several quotations from my small book may I be allowed to allude to a few points. He thinks there is no evidence for "lytic action." The experiment I saw in

Professor Leduc's laboratory and described and illustrated in my book proves that a continuous current causes a transfer of water from the positive to the negative electrode. Increase of water means increased solution, and this is the explanation of "lytic action" under the negative electrode. To assess the value of this in treatment one would select cases in which lytic action would be beneficial and in which the result could be easily confirmed, and avoid choosing cases in which the pathological conditions were problematical, and in which physical conditions, such as depth, militated against ionic exchanges or hydration taking place at the spot desired. Under the former heading we can place the thickening which follows sprains or injury to a superficial joint, such as the ankle, knee, or wrist, as well as cicatrices causing limitation of movement. In these cases there is ample clinical evidence to confirm the benefit claimed for ionization treatment. Instead of selecting cases in which the nature of the lesion is evident and in which the result is decisive Dr. Campbell has elected to draw his conclusions from cases in which the premisses, so to speak, are not clear.

With a good deal of what he says about the penetration of ions I agree, but I do not think he is justified in saying that ions introduced electrically present no differences in effect from a solution of a salt given by hypodermic injection. He describes the physiological effect on distant organs, such as the brain, as following both methods, but it must be remembered that ionization is usually practised for its local effect. When a hypodermic injection is given there is no reason to believe that in all cases the local cells of the tissues, as distinct from the lymph around them, are penetrated by the salt, whereas when ions are introduced electrically it is believed that both cells and intercellular fluid are penetrated. There is also an exchange of ions between the cells and the fluids of the tissues at a greater depth than that to which the great majority of introduced ions have penetrated. This exchange of normal ions between cells and fluids in apposition is a paraphrase for the word "nutrition." The skin is the great sense organ, abundantly supplied with nerves. Even without penetrating beneath the skin there is a wide field for the introduction of soothing ions, such as the salicyl ion, into the terminations of the nerves in neuralgias, and also in those superficial pains in which the seat of the disease can only be acted upon reflexly.

Dr. Campbell says he has no practical experience of ionization for surgical cases, but he makes some theoretical statements about the mode of action of zinc ionization with which I cannot agree. One striking result of zinc ionization for sepsis is the rapid subsidence of inflammation.—I am, etc.,

London, W.1, March 13th. A. R. FRIEL.

BLIND MASSEURS.

SIR,—I am very interested in the work of the Association of Certificated Blind Masseurs, of which I have the pleasure to be President. It has recently published leaflets giving the addresses of its members in London and all parts of the British Isles. May I venture to suggest that all registered medical practitioners should obtain copies from the secretary of the Association, 224 6-8, Great Portland Street, London, W.1?

These leaflets show that members of the Association, both masseurs and masseuses, are established in practically all the large towns, as well as in all parts of London and the suburbs. As massage is work which, it is generally recognized, can be most efficiently carried out by blind people properly trained, those doctors who can see their way to the employment of the members of the Association of Certificated Blind Masseurs will be aiding in a work of national importance.—I am, etc.,

Liverpool, March 8th. ROBERT JONES.

MEDICAL AXIOMS AND APHORISMS.

SIR,—Permit me an observation on your friendly review of my *Medical Axioms, Aphorisms, and Clinical Memoranda.*

It did not occur to me that unsigned axioms and aphorisms would necessarily be regarded as my own composition. Some of them are part of the common heritage and tradition of medicine. Their authorship would be difficult, or perhaps impossible, to determine.

In every case where the author is known to me his name was appended.—I am, etc.,

Belfast, March 12th. J. A. LINDSAY.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

MR. M. B. R. SWANN, M.A., M.B., who since 1920 has been University Demonstrator in Pathology, has been elected to a corporate Fellowship at Gonville and Caius College, and appointed a lecturer.

UNIVERSITY OF LONDON.

THE regulations in the Faculty of Medicine for internal students have been amended by the addition of the following after the word "physiology" in line 2, paragraph 4, section IV, on page 240 of the Red Book, 1922-23: "or the B.Sc. Honours Examination in Physiology."

Sir William Collins has been reappointed the representative of the London County Council on the Senate for the period 1923-27.

The ceremony of Presentation Day will take place in the Albert Hall on Thursday, May 3rd, and not Wednesday, May 2nd, as stated in the University Calendar (White Book).

Applications for grants from the Dixon Fund for assisting scientific investigations must be sent in between April 1st and May 15th, and for the Thomas Smythe Hughes Medical Research Fund for assisting original medical research between May 1st and June 15th. Further particulars may be obtained from the Academic Registrar.

UNIVERSITY OF SHEFFIELD.

THE Council at its meeting on March 9th made the following appointments: Mr. G. Grant Allan, M.B., Ch.B., D.P.H.Edin., to the post of Assistant Bacteriologist; Miss Clara D. Tingle, M.B., Ch.B.Shef., to a Demonstratorship in Pathology.

UNIVERSITY OF DUBLIN.

TRINITY COLLEGE.

THE University of Dublin, on March 12th, conferred the honorary degree of M.D. upon Dr. William James Mayo, the well known surgeon of Rochester, U.S.A., and Professor E. H. Tweedy, gynaecologist to the Royal City of Dublin Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Council Election.

THE Secretary of the College of Surgeons has sent out the usual announcement, which on this occasion informs the Fellows of the College that a meeting will be held at the College on Thursday, July 5th, at 2 p.m., for the election of four Fellows into the Council in the vacancies occasioned by the death of Sir Charles Ryall, by the retirement in rotation of Sir Charters J. Symonds, K.B.E., C.B., and Sir Herbert F. Waterhouse, and by the resignation of Mr. F. F. Burghard, C.B. Blank forms of the requisite notice from a candidate and of his nomination may be obtained on application to the Secretary, and the same must be received by him, duly filled up, not later than on Monday, March 19th. A voting paper will be sent by post to each Fellow whose address is registered at the College, on Tuesday, April 3rd. Had Sir Charles Ryall lived he would have had to retire in rotation, having been elected on the Council, like Sir Charters J. Symonds and Sir Herbert Waterhouse, in 1915. Mr. Burghard having been elected in 1921, the candidate who comes out fourth on the poll will be substitute member until 1929.

The Services.

DEATHS IN THE SERVICES.

Deputy Inspector-General Alfred Gideon Delmege, M.V.O., K.H.S., R.N. (retired), died at Blackheath on February 2nd, aged 76. He was the son of the late Julius Delmege of Rathkea'e, co. Limerick. He graduated M.D. in the Queen's University, Ireland, in 1868, and took the L.R.C.S.I. in the same year. He entered the navy as assistant surgeon in 1869, became fleet surgeon in 1889, and retired ten years later, with an honorary step of rank, as D.I.G. He served in the Ashanti war of 1873-74, going out with the first detachment of Royal Marines sent to Cape Coast Castle, and received the medal, also the thanks of the Admiralty for his services. In 1879-82 he served on H.M.S. *Bacchante* during the voyage round the world made by Princes Albert Victor and George during these years. From 1887 to 1899 he served on the Royal yacht *Osborne*. He was awarded the M.V.O. for his services as medical attendant to the Prince of Wales, the present King, during his illness in 1898, and was appointed Honorary Physician to the Prince of Wales in 1899, and subsequently Honorary Surgeon to King Edward VII. In 1884 he married Mary Elizabeth, daughter of the late Right Hon. James Anthony Lawson, by whom he had two sons.

Lieutenant-Colonel Herbert Stockley Taylor, R.A.M.C., died at Kampti, in the Central Provinces of India, on November 17th, 1922, aged 53. He was born on July 21st, 1869, and educated at University College, London, taking the M.R.C.S. and L.R.C.P.Lond. in 1895. After filling the post of senior house-surgeon of the Clayton Hospital, Wakefield, he entered the R.A.M.C. as lieutenant on January 29th, 1899, becoming major after twelve years' service, and became lieutenant-colonel in 1915. He served in West Africa in 1901, in the expedition up the Gambia river, receiving the African general service medal with a clasp, and also in the recent great war.

Obituary.

SIR THOMAS RODDICK, M.D., F.R.C.S.,

Formerly Professor of Surgery, McGill University; Ex-President of the British Medical Association.

SIR THOMAS RODDICK, who, as briefly announced last week, died on February 20th, was President of the British Medical Association on the first occasion on which it held its Annual Meeting outside the British Isles; this was in 1897, and it was largely through Roddick's influence that the invitation was given and accepted. He held a position of great prominence in the profession in Canada at the time, being professor of surgery in McGill University, Montreal, and a member of the Canadian Parliament. He came over here in the winter of 1896, and his genial presence, force of character, and ready speech at once made him many friends in the Association and paved the way for the success of the Montreal meeting.

Sir Thomas Roddick, who received the honour of knighthood in 1914, had been in failing health for several years; he had been in the habit of spending each winter in the more genial climate of Florida, but this year did not make the journey, and died in his house in Montreal.

Thomas George Roddick was the son of the principal of the Government Grammar School at Harbour Grace, Newfoundland, and was born there on July 31st, 1846. He entered McGill University, Montreal, in 1864, and was the first student of his year, taking the Holmes gold medal. On the completion of his curriculum he entered the General Hospital, and acted as resident surgeon for six years. In 1874 he became demonstrator of anatomy in McGill University, and attending surgeon at the General Hospital; in 1875 he was appointed to the chair of clinical surgery. At the outbreak of the North-West rebellion in 1885 he was appointed deputy surgeon-general to the militia of Canada, and went to the front to organize the medical service and to make all necessary arrangements with regard to hospitals. In 1890 he succeeded Dr. Fenwick in the chair of surgery at McGill University, and upon the erection of the Royal Victoria Hospital, through the munificence of two Montreal citizens—Lord Mount Stephen and Sir Donald Smith (afterwards Lord Strathcona)—he was entrusted with the organization and equipment of the surgical department, and visited all the great European centres in that capacity. In 1893 he became full surgeon and in 1896 consulting surgeon to this hospital. For many years he was chairman of the medical board of the hospital, was Dean of the McGill Faculty of Medicine from 1901 to 1908, and was subsequently appointed a governor of the University.

SIR THOMAS RODDICK.

His distinction as a surgeon was widely recognized, not only in Canada, but also in this country; he was elected an Honorary Fellow of the Royal College of Surgeons in 1900.

Early in his career Roddick came under the influence of Lister, and was one of the first surgeons in Canada to appreciate the true significance of the antiseptic system; to his precept and example the rapid adoption of the method by Canadian surgeons was largely due. Roddick entered the Canadian Parliament in 1896 as member for Montreal West, mainly with the idea of serving the profession and removing some of the legislative anomalies which then existed. When the British provinces became federated in 1867 under the British North American Act the governance of educational matters was taken from the federal authorities and handed over to the provinces; accordingly, each established its own medical board or council, with power to grant a licence to practise, either after examination or simply on presenting the diploma of certain recognized universities. One result was that the holders of diplomas or degrees obtained in the British Isles could not legally practise in Canada without obtaining a licence from the provincial authority; correspondingly, Canadian graduates could not be registered here. The Medical Act passed by the British Parliament in 1886 to some extent removed the disability of Canadians in this country, for it permitted the registration of a person holding a recognized colonial medical diploma, but only if he was by law entitled to practise medicine, surgery, and midwifery in the Dominion of Canada. The Act, however, did not remove the Canadian disability for two reasons: first, because there was no registering authority for the whole of Canada, and secondly because the Act required that before a Dominion practitioner could be registered here it must be shown that the Dominion afforded to registered medical practitioners of the United Kingdom such privileges of practising in the Dominion as established complete reciprocity. It was this situation that Roddick resolved to do his best to change. He travelled into every province of Canada in the course of his propaganda, and eventually (though after he had left the Canadian Parliament) the Canadian Medical Act was passed in 1912; he was elected first President of the Medical Council of Canada, established in accordance with its provisions. In this way he rendered immense service to the profession, and did something towards the consolidation of the British Empire—a cause always dear to his heart—by making the Canadian doctor at home in this country and the British doctor at home in Canada.

Sir Thomas Roddick was twice married—first, in 1880, to Miss M. McKinnon, who died in 1890, and secondly, in 1906, to Miss Redpath, who survives him. He leaves no children, but two sisters, who helped him in dispensing the friendly hospitality he showed to members of the Association in 1897.

For the following tribute to Sir Thomas Roddick we are indebted to Dr. J. G. Adami, Vice-Chancellor of the University of Liverpool, who, as professor of pathology, was his colleague at McGill University:

For his personality and through what he accomplished for the profession Sir Thomas Roddick was deservedly looked up to as the leading figure in Canadian medicine of his generation. As is well shown in the obituary notice, he was the outstanding figure in the long-continued fight to obtain federal registration. The eventual victory owed everything to his persuasive pleading and personal popularity. Roddick, indeed, enjoyed his popularity. He loved to please people, and suffered at times from the very defect of his virtue in that he too easily promised to do those things which he could not perform; yet even those whom he disappointed in this way could not but fall victims to his geniality and inherent kindliness. He was an admirable lecturer and a most popular Dean of the Medical Faculty at McGill. Of late years he had been keenly anxious about his own health and had gradually passed into retirement, so that it is difficult for the present generation to recognize the influence

he exerted during his full maturity from 1890 to 1910. That of which he was most proud was his early association with Lister and the part that he played in introducing the Listerian methods into Canadian surgery. Nor has his influence been confined to Canada. The national registration system which he established and its success has encouraged the leaders in the profession south of the line to move in a like direction. There has been the same problem in the various States as has existed between the Canadian provinces, so that a Massachussets physician, for example, could not practise in the State of New York if he did not possess a New York licence. Only within the last few years there has been a successful movement to introduce legislation and the establishment of a recognized federal medical body whose examinations and diploma shall be accepted by all the States.

NORMAN DALTON, M.D.Lond., F.R.C.P.,

Consulting Physician to King's College Hospital; Fellow of King's College, London.

For some two years past the manifest signs of physical decline had told those who knew Dalton that the sands of life were running out for him apace, and the end came, in his 66th year, on Friday, March 9th, at his house in Hampstead. Born in Demerara in 1857, the youngest of a family of nine children, his father was chief postmaster of British Guiana. After some preliminary education at Queen's College, Demerara, he came to England at the age of 16 and joined Christ's College, Finchley. Two years later he passed on to the Medical School of King's College, where and at London University he won many honours. First qualified in 1879, he became M.B. in 1880, M.D. in 1882, and was elected a Fellow of the Royal College of Physicians in 1894. In 1886 he was appointed assistant physician at King's College Hospital, being already pathological registrar. In 1893 he was made professor of pathological anatomy, and at the time of his retirement from the staff only a few months ago he was senior physician and joint lecturer on medicine. He had been examiner in medicine both at London University and the Conjoint Board, and physician to two important life assurance companies—the National Provident Institution and the Scottish Union and National. During the war he gave assiduous service to the 4th London General Hospital and rose to the rank of lieutenant-colonel.

Only the would-be biographer knows how difficult it is to breathe again the breath of life into a dead man's self and give a fleeting resurrection to his personality. One is so apt to slip aside from the strait way of truth into the turgid eulogy of an apotheosis, or into a sterile catalogue of the material circumstances of his life, without regard to the spiritualities that make a study of the life profitable. Generations of King's men will think of Dalton first in association with the *post-mortem* room, where he presided as pathological registrar for some twenty-five years; they will picture him clad in a long white mackintosh reaching from his chin to the soles of his feet, and advancing to his work with a very large knife in hand, which he carried much as a life-guardaman carries his drawn sabre; he was a quick and neat worker, and his demonstration of the morbid conditions was precise, clear, and picturesque. His lectures on morbid anatomy gave students all they needed for examinations in simple direct language, that stuck in the memory, and he took pains to illustrate them by copious drawings and microscopic slides, all by his own hand. His long service in the *post-mortem* room led him to look at clinical questions too exclusively from the standpoint of morbid anatomy, and he took only a half-hearted interest in the great advances in the pathology of the living, in the departments of bacteriology, clinical pathology, and biochemistry that have been the outstanding feature of the three last decades. As a clinician he was a good teacher of the physical examination of patients, always correlating the signs to the structural changes they seemed to imply. Many King's men will remember with gratitude his teaching at a time, now happily long past, when in the aftermath of a galaxy of great clinicians the visiting staff did not lavish instruction on their students. For years he held a popular coaching class, the material of which formed the basis of a little book, *Aids to Medicine*, subsequently published by him. With Dalton conservatism was bred in the bone; the methods that had sufficed for the great clinicians he had served, notably Sir George Johnson, seemed to him to be sufficient for all time. Thus it came about that with the passing of morbid anatomy as the pivot of clinical medicine Dalton came to be a man ploughing a lonely furrow; no visions of a promised land tempted him to explore the large *terra incognita* that lies beyond the confines of the dead-house.

Dalton was a very small man, and regarded this as a serious handicap to professional success: to think it so was to make it so, and to lay up unhappiness for a sensitive nature. Though a man of true courage, physical and moral, he would quail beneath the buffetings of fortune. It was not given to him to gather in profusion the rare and refreshing fruit of successful consulting practice. The courting of this coy and fickle goddess has left many another heart sick and sad. Perhaps he would have found a fairer field for his warmth of heart and faculty for unselfish service in the less exotic atmosphere of general practice.

Nowhere was Dalton so happy as among his patients at Drury Lane Dispensary, with which he had been connected for many years: there heart spoke to heart without restraint or artifice. They would confide in him their domestic concerns as well as their ailments, and to come away with a bunch of flowers or a bag of fruit given as a thank-offering by some poor woman was a real happiness to him.

There was a strong touch of Bohemianism in Dalton's make-up: no kipper was ever so tasty as those he used to toast before the fire in his early years in chambers at Clement's Inn. He was in his element at a men's card party shrouded in an impenetrable atmosphere of smoke, or seated in the ring at Lord's or the Oval, with no companions but his pipe and a newspaper, which served successively as seat, waterproof, plate, and mental pabulum according to the weather and progress of the play. He had read widely in both English and French literature; his taste directed him mainly to the earlier English fiction, but he had read much poetry as well. He read thoughtfully and formulated precise judgements on what he read; his attitude was rather critical than appreciative, for he was more apt to see the blemishes than the beauties, and to dwell on them.

Though a titular bachelor, Dalton was in full measure a family man; his home in the tropics had been broken up by the death of his father in Demerara while he was a boy of 17 only. Under his hospitable rooftree in Mansfield Street the remnants of a scattered family found haven for many years; there also he became the devoted guardian of six children of a dead brother: the loss of one of these nephews in the late war hit him very hard. Dalton had many friends at his hospital, as two presentations on his recent retirement—the one from past and present nurses, the other from staff and students, commemorating his long and devoted service to the medical school—testified abundantly.

Circumstances, not natural temperament, for there was gaiety very close beneath the surface, made Dalton in later years a convinced pessimist. His friends grieved to see a cloud of despondency settle on him, as with advancing years he retired more and more into himself. It was hard to tempt him away from the solitude of his little garden in Hampstead: there at least he need not expose a warm heart to the chill of an uncongenial world. There he would watch the swelling of each bud and the unfolding of each flower with all the fondness of an expectant mother: the friendship of inanimate things became his all in all; he still had affection to lavish and he lavished it on them. Among his flowers his thoughts would often turn back to his boyhood in the tropics, to its simple freedom, to the sunlight, the warmth, and the lush vegetation, to the sensuous charm of all that he had exchanged for the pomp and gloom of the great heartless city to which destiny had chained him. May his Spirit bask in eternal sunshine in a garden of the flowers that he loved so well! The burial was in Hampstead Cemetery on Tuesday, March 13th, and a memorial service was held at St. Clement Dane's Church.

R. C.

Dr. William MacDermott, who died on January 31st, was a son of a very highly esteemed minister in Belfast. He studied in the Queen's University of Belfast, took the degree of M.B. and B.Ch. in 1914, acted as house-surgeon and as house-physician in the Royal Victoria Hospital, Belfast; he then joined the R.A.M.C. and served as temporary captain for the rest of the war. After demobilization he settled in England, but a low form of blood poisoning set in and he had to return to his home, where he received the unavailing care and attention of his friends and his fellow medical men, both at home and in hospital. Much sympathy is felt with his family in his untimely death.

DR. HUGH KNYVETT, who died at Sidmouth on January 27th, in his 79th year, was the son of a Yorkshire vicar, and early in life emigrated to New Zealand. He remained there for twenty-four years, rising from a shepherd to manager of a sheep station. At the age of 40 he returned to England and entered Guy's Hospital medical school as a student; he took the Scottish triple qualification in 1889. Subsequently he practised at Butleigh for many years, and was well known also in Taunton, where he served on the National Service Medical Board. Five years ago he went to live at Sidmouth, last spring taking a trip to New Zealand and back as a ship surgeon. Dr. Knyvett had a charming personality and was an excellent all-round sportsman.

DR. DAVID CARNEGIE ALEXANDER, M.C., late Captain R.A.M.C. (T.C.), died in Florida on February 17th. He was the eldest son of the late Charles Alexander, of Upland, Selkirk, and was educated at Edinburgh, where he graduated M.B. and Ch.B. in 1905. He took a temporary commission as lieutenant in the R.A.M.C. on February 15th, and was promoted to captain after a year's service. He was gazetted to the Military Cross on November 4th, 1915, being one of the earliest to gain that distinction.

Medical News.

DR. LEONARD HILL, F.R.S., director of the department of applied physiology and hygiene at the Medical Research Institute, Hampstead, has been presented by the Council of the Royal Institution of Mining and Metallurgy with the "Consolidated Gold Fields of South Africa, Ltd." Gold Medal in recognition of his valuable researches on ventilation and his paper on ventilation and human efficiency, contributed to the *Transactions*.

SIR HUMPHRY ROLLESTON, K.C.B., M.D., has been appointed chairman of the Central Joint Voluntary Aid Detachment Council, which is composed of representatives of the War Office, the Territorial Army Associations, the Order of St. John of Jerusalem, and the British Red Cross Society.

MR. H. W. CARSON, F.R.C.S., will give the Hunterian Oration to the society of that name on Monday next at 8.30 p.m., at the Mansion House, London. The subject is the evolution of the modern view on septic peritonitis and its applications.

DR. A. A. MATHESON of Edinburgh was recently presented with a silver tea service at a reception given in his honour by a section of the Jewish community in Edinburgh. Rabbi Dr. Salis Daiches, who made the presentation, thanked Dr. Matheson for the services he had rendered to his Jewish patients, and at the same time presented Mrs. Matheson with a fitted dressing case.

THE forty-fifth festival banquet of the Irish Medical Schools' and Graduates' Association will take place this day (Saturday, March 17th—St. Patrick's Day) at Pagani's Restaurant, after the annual meeting, when Dr. J. A. Macdonald will resign the presidential chair to Sir William Taylor, K.B.E., C.B. Tickets for the dinner, 9s. each, may be obtained by any Irish graduate from the honorary secretary, Dr. Meyrick, 48, Ennismore Gardens, S.W.7.

A MEETING of the Fellows of the Royal Society of Medicine was held on Tuesday evening, when a paper was read by Mr. J. E. Adams on the urgent need for education in the control of cancer. Mr. C. P. Childe, Lord Dawson of Penn, Mr. W. G. Spencer, the Hon. Sir Arthur Stanley, Sir Napier Burnett, and others, addressed the meeting, and resolutions were unanimously carried urging that the public should be given more information as to the early signs of cancer, and requesting the British Red Cross Society to conduct a publicity campaign by means of lectures and pamphlets, and the Council of the Royal Society of Medicine to nominate a standing committee to supply information to the Red Cross Society suitable for public dissemination. A report of the proceedings will appear in our next issue.

MR. T. H. KELLOCK, surgeon to the Middlesex Hospital and consulting surgeon to the Children's Hospital, Great Ormond Street, who died last December, disposed in his will of net personalty amounting to £52,760. He bequeathed £500 to the Hospital for Sick Children, to be expended on some specific object which shall not increase the annual expenditure of the hospital; £100 as a permanent endowment of the medal for the nurses' prize instituted by him; and £100 each to the Santa Claus Convalescent Home for Children at Highgate, the Invalid Children's Aid Association, and the National Society for the Prevention of Cruelty to Children. He bequeathed also personal legacies to certain nurses and others who had worked at the two hospitals with which he was connected.

NEW rules, framed in accordance with the recommendations of the Committee of Inquiry on Artificial Limbs, have been issued with the approval of the Minister of Health, for the guidance of medical superintendents of limb-fitting centres responsible for the ordering of artificial limbs for pensioners. The artificial limb ordinarily supplied will be one of the Ministry's standard pattern legs of wood and leather, but where it is considered that a peg leg will be more suitable for the avocation of a pensioner such a leg may be ordered as one of his two artificial legs. Metal limbs may be supplied for cases of amputation above the knee at the discretion of the surgeon. Metal limbs for amputations below the knee will be supplied only when in the surgeon's opinion special surgical or medical conditions render a wooden limb unsuitable.

THE annual debate of the Chelsea Clinical Society will be held in the Club Room of St. George's Hospital Medical School, S.W., on Tuesday, March 20th, at 8.15 p.m. The subject selected for the debate is Visceroptosis; it will be opened by Sir Charlton Briscoe, followed by Dr. Robert Hutchison, Mr. Ivor Back, and Mr. Mortimer Woolf.

A PETITION for the granting of a charter of incorporation has been presented to His Majesty in Council on behalf of the Wolverhampton and Staffordshire General Hospital.

WE are asked to state that hospitals in the County of London or within nine miles of Charing Cross desiring to participate in the grants made by King Edward's Hospital Fund for London for the year 1923 must make application before March 31st to the Honorary Secretaries of the Fund, 7, Walbrook, E.C.4. Applications will also be considered from convalescent homes which are situated within the above boundaries, or which, being situated outside, take a large proportion of patients from London.

AT a social meeting of the Royal Society of Medicine on the evening of March 21st Dr. H. C. Cameron will deliver a short address at 9 p.m. on the mystery of Lord Byron's lameness.

MESSRS. JOHN BARTHOLOMEW and SON of Edinburgh have issued a railway map of the British Isles, showing the new groups by means of different colours. The L.M.S. (London, Midland and Scottish) seems to be nearly ubiquitous, extending from London to Thurso and from Yarmouth to Swansea. The colours chosen are distinctive and the map, it is hardly necessary to say, is very well produced.

THE thirty-fifth German medical congress will be held next month in Vienna under the presidency of Professor K. F. Wenckebach. On the first day (April 9th) a discussion on encephalitis lethargica will be opened by von Economo of Vienna and Nonne of Hamburg. In the afternoon of the following day there will be a demonstration of patients suffering from disorders of internal secretions. On April 11th a discussion on arterial high pressure will be opened by Durig of Vienna and Volhard. Papers will be read on each of these days, and also on April 12th. On Saturday, April 14th, there will be demonstrations in the morning and excursions in the afternoon.

THE National Association for the Prevention of Tuberculosis will hold its ninth annual conference in Birmingham on the invitation of the Lord Mayor of that city. The conference will open on Thursday, July 12th, and close on the afternoon of the following day. The chief subjects for discussion are: The care of advanced cases of tuberculosis, especially as regards prevention of infection; the extent and nature of damage done by tuberculosis derived from infected milk; the relative prevalence of tuberculosis among workers in different trades; and the amendments which should be made in the procedure for the notification of tuberculosis. Opportunities will be afforded for persons attending the conference to visit various institutions concerned with the prevention and treatment of tuberculosis.

A MEETING of the Association of Economic Biologists will be held at the Imperial College of Science on Friday next, March 23rd, at 2.30 p.m., when Professor J. H. Priestley of Leeds will read a paper on the causal anatomy of potato tuber, and Mr. E. R. Richards will discuss the control of cellulose decomposition and its applications.

MESSRS. A. E. DEAN AND CO. (Leigh Place, Brooke Street, Holborn, London, E.C.1) have issued a list of their diathermic apparatus, with explanatory notes.

PERU is free from yellow fever for the first time in its history. According to Dr. Hanson, Director of Public Health of the Republic, this is a result of the yellow fever campaign carried out by the Rockefeller Foundation and the Peru Government; no cases have been reported since August, 1921.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

WHITE ANTS.

A CORRESPONDENT in West Africa asks for advice as to the destruction of white ants. His woodwork, books, and clothes are, he says, destroyed by them, and he has found tar, kerosene, cyllin, mercury perchloride, and solution of chlorine of no avail. Even if expelled for a time they return within twenty-four hours.

*** We have made some inquiries, and learn from Sir Arthur Shipley that it would be desirable to ascertain the species of termites. Dr. Guy Marshall, C.M.G., F.R.S., of the Natural History Museum, has been good enough to send the following general observations:

I fear the matter is not so simple as it might seem, for it is hardly possible to make useful suggestions without knowing how the house is constructed. If, as is often the case in the tropics, the house is built on piles or piers of brick, something might be done; if, however, it has been built flush on the ground, without foundations, the chances of finding a satisfactory remedy are very remote. Further, it is necessary to know the materials of which the walls are made and the nature of the flooring. In houses built of unprotected timber or sun-dried bricks, the case is practically hopeless once the walls are infested by the termites. The only real protection lies in proper construction. On the second course of bricks above the foundations sheet zinc should be laid throughout so as to project two or three inches clear on both sides; then at least two courses of bricks should be built on top of this before the floor joists are laid. Where houses are built on piers there should be a sheet of zinc right through the middle of each pier and projecting at least two inches clear all round. Otherwise the only thing to be done is to search for the nests under the floor and immediately round the house and treat them with a heavy poisonous gas, such as carbon bisulphide. But this is a tiresome and costly business, and will probably have to be repeated at intervals. When the floor and walls are infested the only course is to keep one's belongings on wooden stands away from the walls, the legs of the stands being placed in saucers or tins. If the latter are filled with paraffin or occasional y dusted with Keating's powder they also serve to keep away house ants, which are often a serious nuisance in the tropics.

BUTYN.

DR. M. D. THAKORE (Doncaster) writes to point out that the cost of butyn recommended recently by Mr. Beaumont as a local anaesthetic (January 13th, p. 57) militates against its general use. He recently had to pay 12s. 6d. for 1 oz. of 2 per cent. solution.

*** We are informed by Dr. Harrison Martindale that the cost of butyn, which is made in America, is exceedingly high, but that the price seems at present justified. The price to medical men is 7s. 6d. a gram, so that an ounce of 2 per cent. solution should cost 7s. or 8s.

INCOME TAX.

"R. I. I." acted in 1920-21 as a non-resident house-surgeon, and deducted £3 3s. a week from the amount received as representing the cost of rooms and attendance.

*** Apparently the deduction cannot legally be made. Our correspondent is assessable on the gross amount less expenses incurred wholly and exclusively and necessarily in the performance of the duties of his office; personal expenses of the kind mentioned do not fall within that category. The point underlying the inquiry is that a resident house-surgeon receiving board and lodging *in kind* is in the unusually favourable position of not being liable to tax on the value thereof—but that is not the case here.

"NEBO" has a daughter over 18 years of age whom he maintains at a cost of £140 per annum in an asylum.

*** The only allowance that can be claimed is the statutory allowance of £25. The *Guide* to which "Nebo" refers was written by Mr. P. Sulley and is published by Thos. Nelson and Sons, Ltd., Edinburgh. That address is sufficient, though doubtless any local bookseller could obtain the book.

LETTERS, NOTES, ETC.

THE PREVENTION OF SEPSIS AFTER BLADDER AND PROSTATE OPERATIONS.

DR. A. LAPTHORN SMITH (London, W.), who expresses the interest and pleasure with which he read Sir John Thomson-Walker's address on problems of prostatectomy (BRITISH MEDICAL JOURNAL, January 27th, p. 133), writes in praise of hexamine. From his experience of transplantation of the ureter and the repair of many vesico-vaginal fistulae, he feels confident that primary union would not have been obtained without the hexamine and drainage. "I have always given hexamine," he continues, "both before and for several weeks after my plastic operation on the bladder and ureters. As all my patients were women I had no difficulty in leaving a self-retaining glass catheter in the bladder for one or two weeks, with a thin, light rubber tube attached leading to a receptacle under the bed. This gives the bladder absolute rest. The perforated glass bulb of the catheter is only half an inch from the entrance of the two ureters, so that the urine never touches the bladder wall at all."

PSYCHOLOGY AND MEDICINE.

DR. RICHARD GILLBARD (Willesden Green), writing with reference to Sir Frederick Mott's lecture (March 10th, p. 403) on psychology and medicine, recalls a passage in a lecture in which the late Sir George Savage combined two famous sayings: "When I see a precocious child I say to myself, there, perhaps, goes a Shelley; there, perhaps, goes insanity. The line of demarcation between insanity and genius is a faint one."

CRAVING FOR TOBACCO.

LIEUT.-COLONEL G. HARRISON YOUNGE, F.R.C.S.I., R.A.M.C.(ret.), writes: Cases are occasionally seen where it is desirable, or even urgently necessary, to discontinue smoking and it is more than probable that instances of this kind will become much more common in future owing to the great increase of smoking amongst women, whose nervous and circulatory systems are so susceptible to the injurious effects of tobacco. Many years ago I found it necessary to stop smoking owing to chronic pharyngitis and I shall never forget the long weeks of intense misery which were endured until the craving for tobacco eventually subsided. Quite recently I have discovered a way in which smoking may be stopped without difficulty and without suffering of any kind. More than a year ago, owing to a return of chronic pharyngitis, I decided to try a herbal smoking mixture. Smoked from an ordinary briarwood pipe in the usual way, it completely satisfied the desire for tobacco and its use was quickly followed by a decided improvement in the symptoms of catarrh and irritation of the throat. After some months of its use I found that the desire for tobacco had completely disappeared and that it was possible to stop suddenly the herbal smoking mixture without difficulty or inconvenience of any kind. If occasionally the thought occurred, "A pipe would be a pleasure," it was only necessary to suck a peppermint lozenge to remove completely this scarcely desirable prompting.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 36, 37, and 38 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 34 and 35.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 87.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page) ...	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.